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ANNALS OF NATURAL HISTORY

I — On *Scrophularia aquatica* of Linnæus and Ehrhart By
CHARLES ABBOT STEVENS, Esq, B A, F B S E *

[With a Plate]

AN examination, through the kindness of Professor Don, of the specimens of *Scrophulariæ* in the Linnæan and Smithian Herbaria has confirmed a suspicion I have for some time had, that under the name of *S aquatica* two distinct species have been confounded by botanists — one, the original *S aquatica* of Linnæus, the other the *S aquatica* of Ehrhart's 'Plantæ Officinales' Thus in his 'English Flora,' Sir J E Smith has combined the characters of the two under that name, his diagnosis, which is merely a translation from that in Linn 'Sp Pl', belonging to the former plant, while to the latter his description principally refers, — not entirely, as some of the characters of *S aquatica*, Linn are mixed up in it The fact of there being a specimen of each of the two species on the same paper in his Herbarium will account for the description having been thus drawn up from their combined characters, as he evidently considered the two as one species, and identical with *S aquatica*, Linn

By several German authors the plant of Ehrhart is described under the name of *S aquatica*, while the true *S aquatica*, Linn is described as another species under the name of *S Balbisi* It seems not improbable that the combination into one of the two species by the late possessor of the Linnæan Herbarium may, for the very reason of that possession, have been the cause of their mistake

The inspection during the last season of a great number of specimens, amounting to not less than several hundred, of *S. aquatica* Linn afforded me no instance of any variation in the integrity of the staminodium, nor have I ever seen any specimen at all approaching *S aquatica*, Ehrh in the inflorescence, or in general habit There can, I imagine, be no

* Read to the Botanical Society of Edinburgh, Feb 13, 1840

Ann Nat Hist Vol. 5 No. 28. March 1840 B

doubt of their distinctness. Roots are, I understand, in the possession of an eminent British botanist, who, by cultivation thereof, will doubtless be enabled shortly to determine the point beyond dispute.

In the mean time it may be useful to give the respective characters of the two plants. They are as follow

- 1 *S aquatica*, Linn. Folius cordato-ovatis rotundito obtusis crenato serratis, inferioribus auriculatis caule petiolisque alatis, panicula terminali, cymis lateralibus corymbosis multi (8—15)-floris, laciniis calycinis subrotundis margine late scariosis staminodio subrotundo-remiformi integro, capsula ovata subacuta
Betonica aquatica Dalech Hist 1356 *Ger Em* 715 f
S radice fibrosa Moris Oxon ii 482 s 5 t 8 f 4
S aquatica major Ran Hist 764
S foliis conjugatis, &c Hall Hcb 618 *Boehm Lups* 66 n 150
S aquatica, Linn Hcb Sp Pl 864 *Curt Fl Lond* v t 44
Engl Bot t 854 *Krock Fl Siles* ii 393 *Sibth Fl Oxon* 196
Sm Fl Brit 663 *Hook Fl Scot* 189 *Grev Fl Edin* 137 *Sm E Fl* iii 139 (diag only) *Sm Herb* n 2 *With Bot Arr* (ed 7) iii 738 *Hook Br Fl* (ed 4) 239 **Sebast et Mauri Fl Rom* 205 **Pollinus Fl Veron* 325

S scorodonia (*aquatica* ? *Sm not*) *Linn Herb* (without ref to *Sp Pl*)

S Balbisii, Hornem Fl Hafn ii 577 *Bluff et Fingerh* (ed 2) i p 2 389 *Koch Syn* 515 **Guss Fl Sic Prodr* ii 172

Hab (Cambridgeshire very common *Mr H Baber* Shropshire common *Mr W A Lighton* Very common in ditches and damp places in Kent, and probably general throughout England

Perennial July—September

Root fibrous. Stem erect, from 2—8 feet high, branched below, mostly simple above, square, winged at the angles. Leaves ovate-oblong or elliptical, cordate at the base, very obtuse, uppermost occasionally subacute, the lower ones with one or a pair of variously shaped stalked or sessile accessorial leaflets, smooth or downy beneath, doubly-, the upper ones most simply-, crenate. Petioles winged, channelled, decurrent. Panicle many distant, mostly opposite, dichotomous, many flowered, compact, corymbose cymes. Peduncles and pedicels glandulose. Bracts linear obtuse, rarely (as in the specimen in the Linnæan Herbarium, which is, however, apparently

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Mr Templeton on the Fungi of the North of Ireland

of garden growth), developed into lanceolate acute ~~leaves~~
Sterile filament rotundato-reniform, entire Sepals with a
broad membranous margin, torn at the edges Capsules ovate,
more or less acute

2 *S Ehrharti* Folius ovato-lanceolatisve basi subcordatis acutis
serratis, caule petiolisque alatis, panícula terminali, cymis late-
ralibus laxis pauci-(4—6)-floris, lacinus calycinis subrotundis
margine late scariosis staminodio bifido lacinus divaricatis, cap-
sula globosa obtusissima

S aquatica Ehrh Pl Off n 156 *Sm Herb* n 1 *Fl Dan*
t 507 *Kunth, Fl Berol* n 60 *Bluff et Fingerh* l c *Rchb Fl*
excurs n 2562 *Koch, Syn* 515 **Peterm Fl Lips* 459 **Host*
Fl Austr n 203 **Wimm et Grab Fl Siles* n 226

Hab Edinburgh *Mr W H Campbell*, Cramond Woods, West
Lothian *Dr A Hunter* It has also, I believe, been found near
Primrose Hill by *Mr J D C Sowerby*

Perennial — ?

Root fibrous Stem erect, 2—3 feet high, simple, square,
winged at the angles Leaves ovate, ovate-oblong or lanceolate,
slightly cordate at the base, acute, simply and finely serrate
Panicle of many, mostly alternate, dichotomous few-flowered
cymes Peduncles and pedicels divaricating, slightly glandu-
lose Bracts foliaceous lanceolate acute, simple or tripartite,
in which latter case the segments are lanceolate Sterile fila-
ment obreniform, bifid, the lobes divaricating Sepals with a
broad torn membranous margin Capsule globose, very obtuse

REFERENCES TO PLATE I fig 1

- a a* Single cymes of the two Plants
- b b* Staminodia of ditto
- c c* Margins of leaves of ditto

II — *Catalogue of the Species of Fungi obtained in the North
of Ireland, by JOHN TEMPLETON, Esq, of Cranmore,
Belfast By THOMAS TAYLOR, M D, M R I A, F L S*

Dunkerron, Kenmare, 12th March 1839

THE following Catalogue of Fungi collected by the late Mr
John Templeton in the vicinity of Belfast, is drawn up from
drawings and specimens left by him, and which Mrs Templeton
placed in my hands, with a desire that I should carefully
ascertain the species and their modern names with a view to

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publication I have bestowed upon them my best attention, and yet the list is deficient by a few of the drawings whose counterparts I have not yet met with in nature, and by a very few of the specimens from whose imperfect state no satisfactory conclusions could be drawn. Still I cannot but admire the industry and talents of one who, at least equally successful in all the other departments of zoology and of botany, displayed so intimate a knowledge of plants difficult of investigation, at least before the termination of the last century, when the greater part of his collection was already made

THOS TAYLOR

1 AGARICUS, Linn

vaginatus, Batsch
muscaius, L
clypeolarius, Bull
cristatus, Bolt
eburneus, Bull
rutilans, Schæff
multiformis Schæff
personatus Fr
alutaceus, Pers
emeticus, Schæff
cilioides, Fr
zonarius, With
giganteus, Sou
nebularis, Batsch
pratensis Pers
puniceus, Fr
coccyus, Wulf
laccatus Scop
pehanthinus, Fr
butyraceus, Bull
compressus, Sow
confluens, Pers
Clavus, Bull
Rotula Scop
androsaceus, L
caulicinalis, Bull
galericulatus, Scop
•purus, Pers
corticola, Bull
stellatus Fr
umbelliferus, L
fragrans, Sow
flabelliformis, Bolt
applicatus, Batsch
fertilis Pers
pascuus, Pers
evernus, Fr
gentilis, Fr
sublanatus, Sow
bulbosus, Sow
scaurus, Fr
aureus, Bull
squarrosus, Mull
mutabilis, Schæff

collinitus Sow
fastibilis, Pers
flavidus Schæff
scaber, Mull
glophyllus Bull
tener Schæff
involutus Batsch
variabilis, Pers
Georgii, With
campestris, L
semiglobatus, Batsch
fascicularis Huds
seniovatus Sou
Boltoni, Pers
disseminatus, Pers
atramentarius, Bull
micaceus, Bull
cinnamomeus L
personatus, Fr
fragilis, Batsch
dilutus, Pers
coherens, Pers
cavathiformis Bull
chalybeus, Pers
Bulliardii, Comp

2 CANTHARELLUS, Adans

cibarius, Fr
lobatus Pers
laevis Fr

3 MERULIUS, Hal

corium, Grev
lachrymans, Wulf

4 POLYPORUS, Mich

lentus, Berk
squamosus, Huds
perennis, L
giganteus, Pers
versicolor, L
pallescens, Fr
radiatus, Sow
medulla panis, Jacq
ferruginosus Schrad

5 BOITUS, Dill

luteus, L
bovinus, L
piperatus Bull
subtomentosus, L
edulis, Bull

6 FISTULINA, Bull

hepatica, With

7 HYDNUM, Linn

repandum, L

8 THELEPHORA, Ehrh

epidermea, Pers
caerulea, Schrad
aurantiaca, Sow
calcea, Pers
purpurea, Pers
rubiginosa, Schrad
hirsuta, Willd
laciniata Pers

9 CLAVARIA, Fall

coralloides, L
rugosa, Bull
pistillaris, L
vermicularis Sou
tuberosa, Sow
cornea, Batsch
inæqualis, Mull
pratensis, Pers

10 GEORGLOSSUM, Pers
glabrum, Pers

11 MITRULA, Fr
paludosa, Fr

12 TYPHULA, Fr
erythropus, Fr

13 PISTILLARIA, Fr
puberula, Berk

14 HEIVELLA, Linn
lacunosa, Afz

15 LEOTIA, Hall,
lubrica, Scop

16 PEZIZA, Dill
vesiculosa Bull
humosa, Fr
coccinea, Jacq
brunnea, Alb & Schw
scutellata, L
stei corca Pers
virginea, Batsch
calycina, Schum
inflexa, Bolt
Calyculus, Sow
citrina, Hedw
lenticularis, Bull
cinerea Batsch
acicularis, Bull
aurantia, Pers
aquatica, DeCand
cochleata Bull
lycoperdoides, DeCand
nivea, Hedw fil
villosa, Pers
papillata, Pers

17 BULGARIA, Fr
sarcoides, Jacq

18 TREMELLA, Dill
mesenterica, Retz
albida, Smith
sarcoides With
difformis, With

19 DACRYMYCES, Nees
stillatus, Nees

20 SCLEROTIUM, Tode
complanatum, Tode
durum, Pers

21 NIDULARIA, Bull
Crucibulum, Pers

22 SPHEROBOLUS, Tode
stellatus, Tode

23 PILOBOLUS, Tode
crystallinus, Tode

24 SPHERIA, Hall
militaris, L
Hypoxylon, L
carpophila, Pers
fragiformis, Pers
fusca, Pers
stigma, Hoffm

disciformis, Hoffm
flavo virens, Hoffm
coccinea, Pers
aurantia, Pers
hyssiseda, Tode
moriformis, Tode
Pulvis pyrius, Pers
ocellata Fr
Tiliæ Pers
Gnomon, Tode
punctiformis, Pers
Agopodii, Pers
Vacuum, Sow
Taxi, Sow
rimosa Sow
Illicis, Schluch
lanciformis Fr
spermoides, Hoffm
acuta, Hoffm
serpens, Pers

25 DOTHIDEA, Fr
typhina, Pers
Geranii, Fr

26 RHYTISMA, Fr
Acerinum, Pers

27 PHACIDIUM, Fr
coronatum, Fr

28 HISTRIUM, Tode
pulicare, Pers
flavum, Pers
conigenum, Mong et N
Rubi Pers
Pinastri, Schrad
Juniperi, Grev

29 BOVISTA, Dill
nigrescens, Pers

30 LYCOPERDON, Tourn
cælatum, Bull

31 FIAPHOMYCES, Nees
granulatus, Alb et Schw

32 ÆTHALIUM, Link
septicum, L

33 SPUMARIA, Pers
alba, Bull

34 DIDYMIUM, Schrad
physaroides, Pers

35 PHYSARUM, Pers
sinuosum, Bull

36 CRATERIUM, Trentepohl
minutum, Leers

37 STFMONITIS, Gled
fusca, Roth
ovata, Pers
typhina, Pers

38 DICTYDIUM, Schrad
umbilicatum

39 ARCYRIA, Hall
incarnata Pers
nutans Bull

40 TRICHIA, Hall
chrysosperma, DeCand
varia, Pers

41 PERICHÆNA, Fr
populina, Fr

42 LICEA, Schrad
cylindrica, Fr
fragariformis, Nees

43 ONYCENA, Pers
equina, Pers

44 SCILBUM, Tode
vulgare, Tode
bicolor, Pers

45 MUCOR, Mich
caninus Pers
Mucedo, L

46 LURORIUM, Link
Herbariorum, Lk

47 CLADOSPORIUM, Link
Herbarum, Lk

48 DEMATIUM, Pers
ciliare, Pers

49 ASIFRILLUS, Mich
glaucus, Lk

50 STACHYIDIUM, Lk
diffusum, Fr

51 CLATHRUM, Alb et S
hydroides, Alb et S

52 BOTRYTIS, Mich
vera, Fr

53 MONILIA, Hall
racemosa, Pers

54 FUSARIUM, Lk
treichalloides, Grev

55 ÆGEMA, Fr
bulbosum, Fr
mucronatum, Fr

56 PODISOMX, Lk
Juniperi Sabinae, Fr

Mr. W Thompson on the Fauna of Ireland

57 PUCCINIA, Pers Graminis, Pers Epilobii, DeCand	59 HIMANTIA, Pers candida, Pers	Senecionis, Schlecht Violarum, DeCand Ruhorum, DeCand
58 ÆCIDIUM, Pers Grossulariæ, DeCand	60 UREDO, Pers Segetum, Pers Caricis, DeCand Labiatarum, DeCand	Leguminosarum, Lk candida, Pers Iini DeCand Rubigo, DeCand

III — *Additions to the Fauna of Ireland* By W THOMPSON, Esq, V Pres of the Natural History Society of Belfast

MAMMALIA

DEIPHINUS MELAS Irull This species is stated by Robert Ball Esq of Dublin to be occasionally driven ashore in large herds on the southern coast of Ireland and to be of frequent occurrence in the month of June at Youghal Here a herd of seventy five came ashore a few years ago of which the average size was from 11 to 18 feet but one individual had attained to 22 feet in length When visiting the South Islands of Arran (off the coast of Clare) in June 1834, accompanied by Mr Ball, a portion of the skeleton of a *D melas* was found by us on the beach On this gentleman revisiting the same islands in the following summer, he saw the remains of a herd of these animals lying where they had perished the inhabitants speak of them as common

AVES

SOMATERIA SPECTABILIS Leach King-Eider A female specimen of this rare British bird was shot in Kingstown harbour near Dublin about the 1st of Oct 1837 and a few hours afterwards came into the possession of Mr R Ball When first seen it was accompanied by two others

LESTRIS RICHARDSONII, Swains Richardson's Skua An adult *Lestris* shot at Malahide, county of Dublin, in September 1837, and in the collection of Dr Farren of Feltrim, exhibits characters much in unison with what are considered to be two species, the *Lest Richardsonii*, and the *Stercorarius cephus* Leach, (Fauna Bor -Amer vol 11 p 432) agreeing with the latter in dimensions, and with the former in colouring At the same time it in size approaches the *L Richardsonii* as described by Jenyns (Man Brit Vert Anim p 282) as nearly as his does the original description in the 'Fauna Bor -Amer' (vol 11 p 433) The following table contains the comparative measurements —

	<i>Lest Richardsoni</i> Swainson		<i>L Richardsoni</i> , Jenyns		<i>Stercorarius cepphus</i> , Leach		<i>Lestris</i> , Irish specimen	
Length, total	in	lin	in	lin	in	lin	in	lin
	22	8	21	0	19	0	19	9
— (including cen- tral tail feathers }	19	6	18	0	16	0	16	9
— of wing	13	6	13	0	13	0	12	6
— of bill above	1	1	1	2½	1	2	1	3*
— of bill to rictus	1	10	1	9½	2	0	1	10
— of tarsus	1	10	1	9	1	8	1	9
— of middle toe and nail }	1	9½	1	8½	0	0	1	7½

Two longest tail feathers very much acuminate the others in creasing gradually in length from sides to centre those next in length to the two central ones exceeding the outer feathers by one inch breadth of bill at base 6 lines

Top of head, back upper surface of wings and tail blackish brown, varying in some places to blackish entire under surface likewise dark coloured, except the tail feathers which show a little white beneath patch from the eye downwards pale straw colour This colouring is in accordance with that of the *L. Richardsoni* of Fauna B A Mr Jenyns remarks that the species is subject to considerable variation of colour in the adult state — his description of its plumage accords tolerably well with that of *S. cepphus*

I should have set down the Irish *Lestris* simply as a small individual of *L. Richardsoni* had not its general accordance with *S. cepphus* at the same time suggested whether it might not as well be considered this bird and consequently whether these terms apply to two really distinct species An examination of specimens would at once decide the question†

ANSER FERUS Steph Wild Goose In the collection of R Ball Esq there is a specimen of this goose purchased by him in Dublin market early in the winter of 1837 and which was stated to have been shot in this country two others of this species were exposed for sale at the same time Judging from its small size the specimen is a female it displays the blackish markings disposed irregularly over the lower part of the breast and the belly which Temminck considers indicative of very old individuals of both sexes (Man d Orn 1 Eur t 2 p 819) These markings have generally been unnoticed

* Following the curve, the others may have been measured in a straight line

† Since the above was written the 4th part of Temminck's 'Manuel' has been published, and here *S. cepphus* appears as a synonym of *L. parasiticus* (p 502). The description of *S. cepphus* would indeed seem about equally applicable to a small *L. Richardsoni* or a large *L. parasiticus* *

in the descriptions of the species. This is the first Irish specimen of the true Wild Goose or Grey Lag, that I have seen the Bean Goose being in this country, as in England and Scotland, the common species and with the White-fronted, to be seen in our markets every winter. *Anser ferus* is the scientific appellation bestowed on the wild-goose noticed in some of our county histories, but as it there appears to the exclusion of the two more common species just named and has not a place in Mr Templeton's catalogue of Irish Birds I introduce it here. At the same time there is little doubt that the true *A ferus* is the species alluded to in Ruttys 'Natural History of Dublin' as the "larger sort which stays and breeds here, particularly in the bog of Allen" vol 1 p 333, similar allusions to it appear in one or two other county histories.

Mr Jenyns considers it 'highly improbable' that the domestic goose has been derived from this species (Manual, p 222). After a careful comparison of the individual under consideration with the domestic species, I cannot perceive any difference except in the superior size of the latter, the result I presume of domestication. The form of the bill in the *A ferus* is quite identical with that of the tame goose, and at once distinguishes it from *A segetum* and *A albifrons* *

REPTILIA

CHELONIA CAOUANA Schweigger *Testudo carolina* Linn

Loggerhead Turtle Shaw, Gen Zool vol iii p 85 pl 23

To the kindness of H H Domburn, Esq of Dublin, I owe the opportunity of examining a turtle of this species hitherto unnoticed on the British shores, which was obtained on the coast of Donegal in May 1838, and soon afterwards came into his possession. The specimen, about a foot in length, was taken by a man engaged in collecting sea weed for manure and who finding the hook at the end of the long pole used for "hauling in the rack," had caught in something, carefully drew it towards him, when the captive proved to be a living turtle whose eye the hook had entered. Mr R Ball informs me that a turtle of this species in his collection was taken alive in the sea near Youghal, but he has been inclined to regard it merely

* *Totanus Glareola*, Temm. Mr R Ball has described to me a species of *Totanus* which he saw for several years about the month of June frequenting a stream in Glenbower Wood near Youghal, and believed to be this bird.

In the late Mr Templeton's MS a sandpiper considered to be of this species is noticed as having been seen in the neighbourhood of Belfast, but as in the previous instance in terms which do not warrant its introduction to the Fauna with certainty.

as an individual washed off the deck of a vessel, or one that had escaped from the cord which was intended to secure it when (as is a common custom on board ship) it may have been committed to the sea for the benefit of a swim. However, as both the specimens which have been procured on the Irish coast are of the same species, and one which according to Dumeril and Bibron is very common in the Mediterranean, and of occasional occurrence in the Atlantic Ocean they may by the natural influence of winds and waves have been carried to our shores. This remark would from the circumstance of its frequenting the same seas likewise apply to the much rarer species, the Leathery Turtle, *Sphargis coriacea*, which has been taken on the English coast. The Hawks-bill Turtle *Chelonia imbricata*, now included in the British Fauna may more probably than the other two species, have been washed off the decks of vessels or outlived their wreck, its native abode being so far remote from the British seas as the West Indies and the Indian Ocean*

PISCES

SCOMBER THYNNUS, Linn Tunny Dr Jacob (Professor of Anatomy in the Royal College of Surgeons) of Dublin informs me that during the herring season about twelve years ago he purchased a specimen of this fish about 2 feet in length (and evidently a recent capture,) from a fisherman who supplied him with the rare species he procured and whose ordinary fishing-ground was off Dublin Bay, within forty miles of the metropolis

GOBIUS UNIPUNCTATUS Parnell. One spotted Goby 'Wern Mem' vol vii p 83, pl 29 I have obtained this on the north-east coast of Ireland, and in Mr R Ball's collection there is a specimen, 3 inches in length, which was procured at Glendore (county Cork) by Mr Geo J Allman. Although well marked individuals of *G unipunctatus* may appear specifically different from *G gracilis* and *G minutus*, yet from having remarked some specimens intermediate in character between the two first mentioned, I am led to doubt whether in these days of refinement the old *Gobius minutus* has not been multiplied into too many species

CYCLOPTERUS CORONATUS, Couch Coronated Lump fish 'Cornish Fauna,' p 47 'Annals Nat Hist' vol ii p 382 Of this fish, considered by Mr Couch distinct from the *C lumpus*, I procured two specimens, rather exceeding 10 lines in length, by dredging in

* All the localities noted by Dumeril and Bibron, except Havanna, are within, or bordering on the Indian Ocean — *Erpétologie Générale*, tome ii p 51

Strangford lough on the 1st of Oct the particular date is mentioned in reference to the question whether the *C. coronatus* may not be the young of *C. lumpus*. Without offering any opinion on this point, it seems to me proper to notice the capture of this minute fish elsewhere than on the coast of Cornwall where one individual only has been observed.

MOLLUSCA*

" *Nautilus calcar*†, Mont Miltown Malbay (co Clare) in sand "
W. H. Harvey Esq

" ——— *laevigatulus*, Mont Ditto ' Ditto

' *Vermiculus intortum* Mont On a sponge from Strangford '
Templeton s MS

' *Lagenula* (Flem.) *striata* Mont Among sand at the Whitehouse Point [Belfast bay], Oct 1810 ' Temp MS

" ——— *globosa*, Mont Among *Conferva pennata* Belfast Bay '
Temp MS

' ——— *laevis*, Walk M. Malbay, rare—in sand W. H. Harvey

Orthocera glabra Flem Ditto " Ditto

——— *trachia* Flem Ditto Ditto

Miliola ovata Crouch, Illust Lamarck, p. 40 pl. 20 f. 11 Common on the north east, and south coast

" *Loligo media*† Specimens occasionally received from Dublin harbour, Strangford lough, and other inlets Temp MS

" *Octopus vulgaris*, Lam Not uncommon ' Temp MS

" *Arion ater* var *rufus*, var *marginatus* Common " Temp MS

* These having been mostly communicated to me (in 1835) in the order and under the names in which they appear in Fleming's 'British Animals,' are chiefly so arranged, and thus some genera, &c. on which new light has been thrown, still appear under their old appellations. The multiplication of habitats has not been thought of in an article like the present, in which I am particular only about noting the place (in so far as I am informed) where the species occurred to those who in this country first studied and determined them.

Notices of Irish mollusca are so widely scattered, that I may, after having taken considerable care, still be in error respecting the introduction of some species as "additions" to the Fauna.

† *Spirula australis*, published many years ago as found by Mr. O. Kelly on the coast of Kerry, is mentioned in the late Mr. Templeton's MS as having been obtained "near Whitehouse, Belfast Bay, and at Portrush near the Giant's Causeway, by Mrs. Clewlow. Mr. R. Ball has procured it near Youghal, as Mr. W. H. Harvey once did on the coast of Clare.

• † This is indicated as Irish in the abstract of a paper by Mr. R. Ball just published in the Proceedings of the Royal Irish Academy with this explanation the species is here retained in consequence of the late Mr. Templeton's note on it.

- ‘ *Arion hortensis* Fer Common at Cranmore [Belfast] ” Temp MS Coloured drawings of the var of this species named *A. circumscriptus* by Dr Johnston were made by Mr Templeton in 1808
- “ *Limax agrestis*, Gmel Common ” Temp MS
 — *variegatus*, Fer (Hist de Moll p 71^e pl 5 f 1—6) Youghal in Mr Ball’s collection
- Helix concinna* Jeff Common in Ireland, especially in the north
Succinea gracilis, Alder Widely diffused in Ireland Mr Alder I believe now rather considers this to be a variety of *S. amphibia*
Limneus lacustris *Gulnaria lacustris* Leach Found in Lough Neagh and lakes generally
- Iottia ? pulchella*, Forbes Malac Monensis, p 35 ‘Mag Nat Hist’ viii p 591 f 61 In Mr Hyndman’s collection (Belfast) are a few small specimens of this shell—the first obtained on the shore of Belfast Bay by Mrs M Gee, the others found by Mr H adhering to oysters in Belfast market in 1831
- Patella ? Forbesi* Smith ‘Wern Mem’ vol viii p 107 pl 2 One of this species was found by Miss M Ball several years ago in company with *Orbicula Norvegica*, Lam on a stone dredged in very deep water at Youghal
- ? *ancylodes*, Forbes MS Obtained by Mr Hyndman many years ago on oysters from Strangford lough Length 3 lines, breadth $2\frac{3}{4}$ height $1\frac{3}{4}$ The great resemblance this shell bears to the *Ancylus fluviatilis* is not confined to external appearance, but internally it exhibits the same blueish cast
- ‘ *Dentalium striatulum* Found in sand near Cove ” Mr John Humphreys Portmarnock, Mr Warren
- “ *Chiton ruber*, Linn Among oysters from Killinchy, Down ” Temp MS Found by Mr Hyndman and myself in different localities on the north-east coast
- *albus*, Mont As last
- *fuscatus*, Brown Ditto
- Aplysia depilans*, Linn Youghal and Dublin, R Ball, Esq M Malbay, W H Harvey, Esq Obtained by dredging in Belfast and Strangford loughs by Mr Hyndman and myself
- “ —— *punctata*, Cuv Dublin ” R Ball, Esq
- ‘ *Bulla catena*, Mont M Malbay, rare A beautiful little species about a line in length marked with elegant chain-like bands ” W H Harvey, Esq
- *striata*, Brown, Illust pl 38 f 41, 42 Bangor, co Down Mr Hyndman

- Littorina saxatilis*, Bern, MS Northern and eastern coasts common
- Eulima Donovan*, Forbes Mal Mon ' p 15 Youghal and Dublin
R Ball Esq Dredged off Dundrum, co Down, by Mr Hyndman and myself
- *Jeffreys* Dublin coast, Mr Ball and Mr Warren
- *bulineata*, Jeff A Eulima so named by Mr Jeffreys is in the collection of Mr Warren who found it at Portmarnock
- Rissoa striatula Turbo monilis* Lurton M Malbay, rare W H Harvey Esq
- *alba*, var Brown Youghal Miss M Ball
- Odostomia unidentata* Flem Youghal, R Ball, Esq, M Malbay, not rare, W H Harvey Esq
- Natica Alderi* Forbes, Mal Mon p 31 Of frequent occurrence in north, east, and south of Ireland, and h therto passing under the name of *N canrena*
- Marginella voluta* M Malbay rare, W H Harvey Macgilligan (co L Derry) and Belfast Bay, G C Hyndman South Islands of Arran R Ball
- Auricula bidentata*, Ber Youghal and Portmarnock R Ball
- Buccinum oium* [Furt Zool Journ ' vol ii p 366 pl 13 f 9]
Found in the intestines of a Red Gurnard brought to Cork market ' Mr John Humphreys
- " *Cerithium tubercularis* (*Murex tubercularis*, Mont) M Malbay, common " W H Harvey Esq
- Cerithium Pennanti*, mihl *Turbo tuberculata* Penn ' Brit Zool ' vol iv p 129 pl 82 f 111 *Terebra fuscata*, Flem Brit Anim ' *Cerithium fuscatum*, Brown Illust Conch p 9 pl 5 f 67 Of this shell there is a specimen from Youghal in Miss M Ball's collection agreeing with the descriptions of Fleming and Brown, but only tolerably represented in the above quoted figures Mr E Forbes having informed me that the *Turbo tuberculata* of Linn is a different shell, and that the *Cerithium* to which Costa applied the name of *C fuscatum* is likewise distinct I have considered it necessary to bestow a new name on the present species
- ' *Fusus gyrinus* Clare and Youghal " R Ball, Esq
- Lamellaria tentaculata* Mont Linn Trans xi 186 pl 12 f 5, 6 Johnston, ' Mag Nat Hist ' ix 229 f 25 In January 1835
- two small individuals, about 4 lines in length, of this rare species were dredged in Strangford lough by Mr Hyndman and myself
- " *Pecten glaber* Found in the intestines of a Haddock bought in Cork market ' Mr John Humphreys

- Anomia punctata* Youghal R Ball, Esq
Hyalea trespinoza Griff Cuvier Moll pl 3 f 7 " An individual of this species and the first *Pteropode* I believe that has occurred on the British shores was found by Mr R Ball on the coast near Youghal some years ago At the same time *Spirula* and *Ianthina* occurred, but none of them in a living state
Arca fusca Coast of Galway R Ball, Esq, who considers its rank as a species doubtful
Nucula tenuis Found at Portmarnock by T W Warren, Esq
 ——— *nitida* Sowerby Coast of Dublin
Pinna fragilis } Turt Bivalves The three first named noted by
 ——— *papyracea*, } Mr John Humphreys as found at Cove the two
 ——— *pectinata* } first and *P muricata* by Mr R Ball as obtained
 ——— *muricata*, } from the same locality As species they are looked upon with much doubt
*Cardium nodosum** Mont North and east coasts This shell is noticed by Mr Smith as found in the newer pliocene deposits in Ireland 'Wern Mem vol viii part 1
Anodon intermedius Lam I have found this in the rejectamenta of the river Lagan near Belfast
 ——— *cellensis* Pfeiff River Shannon and Grand Canal The *An anatinus* and *An cygneus* have been recorded as Irish Although enumerating these I am not disposed to take the views of authors who make so many species in this genus
Amphidesma distortum Youghal R Ball, Esq
Donax complanata Bantry Bay, rare Mr J Humphreys
Tellina similis Dublin R Ball
 ——— *bimaculata* Bantry " R Ball This species is given doubtfully as Irish in Mr O Kelly's catalogue
Tellinmya ovata Brown's 'Illust Brit Conch' pl 14 f 20, 21 Specimens of this shell from the southern coast are in Mr Hyndman's cabinet
Myrtea spinifera, Turt Bantry Bay Miss M Ball Marked with doubt by Mr O'Kelly as a Portmarnock shell It has been indicated as an Irish species by Mr Jeffreys when noticing the mollusca he obtained at Oban in Argyleshire he remarks that

* *Mytilus edulis*, Linn The variety? *M subsaxatilis*, Williamson, 'Mag Nat Hist' vii 353 has been found at Youghal by Miss M Ball The var *M incurvatus* monopolizes, almost to the exclusion of the other forms of this species, the shores of Ireland that are exposed to the swell of the ocean

Venus virginea, Linn The var *V Sarniensis*, Turt, dredged off the Dublin coast by Dr Lloyd of Malahide

the individuals here procured were "only half the size of the Irish specimens" Sowerby's 'Malac and Conch Mag' No 2 p 43

'*Cyprina minima* M Malbay, rare" W H Harvey Bantry Bay
Mr J Humphreys

Pisidium obtusale, Pflüger? Jenyns I have collected in a few localities in the north-east of Ireland

—— *cinereum*, Alder As last La Bergerie, Queen's county Rev
B J Clarke

'*Fredo bipennata* From the mast of a vessel cast ashore at Youghal"
R Ball M Malbay, W H Harvey

'*Xylophaga dorsalis* In rotten wood at Ringsend, Dublin" W H Harvey*

Montacuta purpurea *Mya purpurea*, Mont Abundant on the north-east coast It was this species and not *Kellia rubra* that was found in the stomach of mullet as noticed in 'Annals Nat Hist vol 1 p 354 *K rubra* also occurs on the Irish shores

Pandora obtusa Leach Lam Penn 'Brit Zool vol iv pl 64 (three lowest figures) ed 1777 same work, ed 1812 *Solen pinna* vol iv p 175 pl 67 f 3 Dredged off Carrickfergus Sept 1835, Mr Hyndman, subsequently by Mr H and myself in Strangford lough

[To be continued]

IV — *Nonnullorum Crambycitum novorum, Novam Hollandiam et Insulam Van Diemen habitantium characteres* By EDWARD NEWMAN, F L S, &c †

Genus SCELEOCANTHA Newman

Prioni facies prothorax utrinque spina recurva laterali armatus,
• pone spinam excavatione semicirculari incisus, postice bisinuatus
tibiae sulcatae carinatae, extus spinosae

* *Pholas papyraceus*, Solander Tuit Brit Riv Mr Harvey has shown me a specimen which he found in 1826 in a fishing boat in Dublin Bay, but as Torbay boats occasionally visit this place, and in one of them it may possibly have occurred, the species cannot be announced as Irish

† At the particular request of Mr Davis, now settled at Adelaide, in South Australia, I have written characters for some of the fine Coleoptera which he has sent to this country that portion of the list containing the Longicorns being ready, I have added a few more descriptions from specimens in the collection of Mr Children, to which he has most obligingly allowed

Sp 1 *Saglabricollis* Piceus, prothorax glaberrimus elytra profunde puncta, punctis humeralibus rarioribus, discoidalibus majoribus, apicalibus crebrioribus Corp long 1.5 unc, lat .66 unc

Exemp unic in Mus D Childien

Habitat Insula Van Dicmen

Sp 2 *S pilosicollis*

Prionus pilosicollis, *Hope, Trans Lnt Soc* tom 1 p 16

Exemp unic in Mus Soc Lnt

" Habitat Nova Hollandia apud Swan River

Genus TOXOTUS, Newman

Mallodonis ferè facies prothorax utrinque spinis recurvis lateralibus acutissimis armatus, spina antica ad marginem anticum sita, valde arcuata spina 2^{da} mediana minus arcuata tibiæ inermes

Sp 1 *I arcuatus*

Prionus arcuatus, *Fabrinus, Syst Litu* tom 11 p 259

Exemp In Mus Brit, &c

Habitat Insula Van Dicmen

Genus MALLIDON Serville

Sp *M stigmatum* Piceum prothorax parallelipipedus, marginibus lateralibus crenatis, angulis posticis reutis, disco minutissime puncto, obscuro, spatius 2 glabris fere trigonis exceptis elytra rugosa abdominis segmenta stigmatum magno utrinque impressa Corp long 1.5 unc, lat .6 unc

Exemp unic in Mus D Childien

Habitat Nova Hollandia

Genus DORX, Newman

Dorci facies caput porrectum medio longitudinaliter sulcatum, mandibulæ validæ, extus et intus arcuatæ apice bidentatæ intus inermes labi- et maxillæ elongatæ, longitudine fere æquales, articulo apicali incrassato, antennæ corporis dimidio longiores, 11 articulatæ articulus 2^{us} brevissimus ceteri subæquales compressæ oculos haud attingentes. prothorax longitudine paullo latior, margo anticus postico latior, margines laterales paullo sinuatæ, elytra linearia, prothorace paullo angustiora disco convexo, apice rotundata tibiæ angulæres, pedetentim incrassatæ apice spinis 2 acutis halteribus 2 obtusis armatæ tarsi manifesto 5-articulati articulus 4^{us} brevis at satis notabilis

me free access and from some others in the British Museum These hasty notes will, I trust, not merely serve to secure me priority in nomenclature, but will, on account of the extreme singularity of some of the forms described, afford considerable interest to our scientific entomologists

Sp *Dorx pentamera* Nigra elytris punctis, spina apicali suturali brevissima armatis pedes picei Corp long 1 4 unc, lat 5 unc
Exemp unic in Mus D Children
Habitat Nova Hollandia

Genus PITHANOTES *Newman*

Prioni facies Caput porrectum mandibulæ validæ extus arcuatæ intus dentibus duobus minutis armatis, apice acutissimæ labi- et maxipalpi breves articulo apicali cylindrico antennæ corporis dimidio longiores 11 articulatæ articulus 2^{us} brevis 3^{us} 4^{um} cum 5^o longitudine æquans prothorax brevis angulis rectangulis utrinque spina acuta mediana laterali armatus tibiæ fere *precedentis*

Sp *Pith falsus* Niger prothorax tuberculis nonnullis, quarum 4 seriem transversam constituunt, armatus elytra ad humeros verrucosa, apicibus rotundatis, spina nulla suturali armata (Corp long 1 25 unc, lat 55 unc
Exemp unic in Mus D Children
Habitat Nova Hollandia

Genus BRACHYTRIA *Newman*

Caput in prothorace receptum oculi fere reniformes mandibulæ et palpi brevissima antennæ dimidio corporis longiores, 11 articulatæ, articulus 1^{us} latitudine duplo longior curvatus 2^{us} 3^{us} et 4^{us} brevissimi cæteri longitudine subæquales vix elongati prothorax capite latior, subglobosus, angulis posticis late excavatus scutellum elongatum apice rotundatum elytra prothorace latiora fere parallela, dorso complanata, apice rotundata inermia pedes breves femoribus pedetentim tumulentibus

Sp *B gulosa* Fusca, facie, gula, capitis parte postica, prosterni parte antica croceis elytrorum margo costalis, macula mediana albida signatus caput rugose punctatum prothorax rugosus punctis magnis confluentibus impressus elytra 3-carinata, utriusque cuneæ duæ distincte fere ad apicem desinens, 3^a subsuturalis indistincta longe ante apicem desinens Corp long 7 unc, lat 1 75 unc
Exemp 1 in Mus Brit ex dono Rev Augusti Beaufort
Habitat Insula V in Diemen

Genus NECYDALIS, *Linnaeus*

Caput exsertum antennarum articulus 4^{us} sequentibus manifesto brevior femora apice pedetentim tumida, metatarsi manifesto dilatati

Sp *N auricomus* Niger, capite croceo, antennis oculisque nigris, prothorax nigerrimus, opacus elytra semipellucida, pallida, apicibus ni-

gigantibus pectus et abdomen lanugine unguis vestiti (Corp long 1 unc, lat 075 unc)

Exemp 1 in Mus D Turner

Habitat Nova Hollandia "Exemp unice prope Adelaide lectum tantum vidi A H Davis

Genus *HISTIRIS* Newman

Caput pronum in prothorace ad oculos reconditum antennae *maris* corpore longiores 12-articulatae, *feminae* corpore breviores 11 articulatæ apice paullo crassiores articulus 4^{us} 5^o et sequentibus vix brevior prothorax valde convexus capite manifesto latior vix longior lateribus medio vix productis elytra abbreviata, quadrata corpus obesum lanuginosum pedes compressi femoribus vix tumidis protarsi paullo dilatati meso et metatarsi nullomodo dilatati

Sp 1 *H variegatus*

Molochus variegatus, *Lab Syst Fleu* tom ii p 375

Exemp in Mus Ent Club

Habitat Nova Hollandia

Sp 2 *H ferrugineus*

Molochus ferrugineus, *Macleay — Boisduval, Faune de l'Océan*, p 187

Exemp in Mus Ent Club

Habitat Nova Hollandia

Sp 3 *H cingulatus*

Molochus cingulatus, *Knby, Trans Linn Soc* vol xii p 170

Exemp in Mus Ent Club

Habitat Nova Hollandia

Sp 4 *H bizonatus* Abdominis zonula 2, prothoracis margo anticus tenue flavus, antennae breviores graciles ferrugineae, apice crassiores fuscae pedes ferruginei, femoribus apice nigris profundiora fere tota nigra Corp long 7 unc, lat 175

Exemp 1 in Mus Soc Zool Lon

Habitat Nova Hollandia

Genus *HELIOMANES*, Newman

Caput pronum vix exsertum, antennarum gracilium articulus 4^{us} sequentibus haud manifesto brevior, elytra oblonga apice rotundata corpus gracile femora apice repente et manifesto tumida, tarsi mediocres simplices

Sp 1 *H Sidus* Fuscus, antennae corpore breviores prothorax elongatus medio longitudinaliter impressus, utrinque pone medium dente laterali armatus elytra extus curvata, fusca, fasciis albidis undulatis duobus (Corp long 3 unc, lat 075 unc)

In Mus D Children et D Hope

Habitat Nova Hollandia

Genus CALIDIDIUM, Fabricius

Sp *C Iaberi* Fuscum, nitidum elytra puncta, utriusque discus macula magni testacea signatus femora pallida, tumida tibiæ tarsique suturati Corp long 325 unc, lat 1 unc

Exemp 2 in Mus D Turner

Habitat Nova Hollandia "Exemp 2, prope Adelaide lecta A H Davis

Genus COITOMMA, Newman

Caput in prothorace fere ad oculos reconditum porrectum, prothorace angustius oculi arcuati medio ad antennarum basin profunde emarginati fere divisi antennæ glabræ, *maris* valde, *femina* vix corpore longiores, 11-articulatæ articuli e quarto compressi elytra basi prothorace latiora apice angustiora rotundata inermia *femina* haud abdomen tegentia femora pedetentum tumida inermia

Sp 1 *C virgatum* Atrum fulgore chalybeo nitens antennarum apicibus albidis caput albido 4 lineatum, lineæ 2 verticis inter antennis desinunt, 2 laterales oculos secant et in faciem adjunguntur prothorax albido 4 lineatus, lineæ lineis capitis continuæ elytrorum limbo luteo maculam basalem obliquam, alteram medianam transversam, multisque minores irrotatas format metafemora macula mediana albidis signata (Corp long 8 unc, lat 3 unc)

Exemp 2 in Mus D Childien

Habitat Nova Hollandia

Sp 2 *C textorum* Testaceum, fulgore chalybeo nitens, lineis 2 capiti prothoraci, elytrisque communibus albidis lineæ elytrorum medio longitudinaliter hiantes (Corp long 6 unc, lat 2 unc)

Exemp 1 in Mus D Children

Habitat Nova Hollandia

Genus ISCHNOGYS, Newman

Caput pronum in prothorace ad oculos reconditum oculi magni sphaeroides, vix emarginati, antennæ prothorace duplo longiores, filiformes, 11-articulatæ, articulus 1^{us} tumidus, 2 minimus sequentes graciles elongati prothorax absolute cylindraceus, capite quintuplo longior, ad marginem posticum pedes brevissimos ferens elytra linearia, prothorace vix latiora at manifesto longiora, apice rotundata inermia pedes simplices

Sp 1 *Cylindraceus* Nigra, opaca inter oculos linea longitudinalis vix elevata prothorax subtilissime punctus, sed ad marginem posticum serie transversali punctorum profundorum impressus elytra profunde puncta pedes brevissimi (Corp long 525 unc, lat 05 unc)

Exemp 1 in Mus D Turner

Habitat Nova Hollandia "Exemp 1 prope Adelaide lectum A H Davis

Genus *XYSTROCFRA* Serville

Sp 1 *X. virescens* Fusc., splendore virescenti litta prothorax et elytra puncta punctis plus minusve confluentibus elytra 3-lineata, lineis haud prominentibus, apice rotundata (Corp long 12 unc, lat 3 unc)

Exemp 1 in Mus Brit D Hardwicki legato

Habitat Nova Hollandia

Genus *PHORACANTHA*, Newman

Hujus generis species sub genere *Stenocorus** celeberrimi Geoffroy collocant MacLay, Hope et Boisduval autem *Stenocorus* cum genere *Rhagium* distincte est synonymus scilicet Sp 1 *Ste bifasciatus* *Rhagium bifasciatum* certe est iterumque Sp 2 *Ste Inquisitor* *Rha Inquisitor* sine dubio Audinet Serville (nisi sub nomine *Malloccera** insectorum Americæ Meridionalis genus) species haud collocat Generis typus *Cerambyx semipunctatus* Donovan Antennarum articuli plus minusve apice 1 spinosi prothorax utrinque medio 1-spinosus spina plus minusve prominens elytra apice truncata plus minusve bispinosa descriptionem fusiorcm haud requirit genus per cognitum Novam Hollandiam species omnes incolunt

Sp 1 *P. Synonymia*

Stenocorus punctatus Kirby 'Transactions of the Linnæan Society, xii 471 "Antennæ breviores rufo picce articulis 5 intermediis, cæteris apice spinæ armatis, &c'

Sp 2 *P. tricuspis*, ined *

Sp 3 *P. quinaria*, ined

Sp 4 *P. punctata*

Stenocorus punctatus, Donovan, 'Epitome of the Insects of New Holland

Sp 5 *P. obscura*

Stenocorus obscurus, Donovan, Id

Sp 6 *P. semipunctata*

Stenocorus semipunctatus, Oliv 69, tab ii fig 19

Stenocorus semipunctatus, Fab Syst Eleu ii 306

Stenocorus semipunctatus, Donovan, Epitome, &c

Sp 7 *P. curvispina*, ined

Sp 8 *P. rubripes*

Stenochorus rubripes Boisduval, 'Faune de l'Océanie,' p 477

Sp 9 *P. dorsalis*

Stenochorus dorsalis, MacLay, 'Appendix to King's Voyage, ii, 451

Sp 10 *P. aberrans*, ined

Sp 11 *P. ventralis*, ined

Sp 12 *P. biguttata*

Stenocorus biguttatus, Donovan
—— tessellatus, Latreille

Sp 13 *P. senio*, ined

* I was on my way to the printers, with the MS of these notes in my pocket, when accidentally meeting Mr Westwood, I learned that the Rev F W Hope was about to publish figures and descriptions of several new species of this genus I have therefore withdrawn the descriptions I had written, lest my new species should clash with Mr Hope's

Genus DIDYMOCANTHA Newman

Caput exsertum vix pronum, oculi magni, reniformes, antennis fere amplectentes, antennæ corpore manifesto longiores 11-articulatae articulus 1^{us} paullo tumidus, 2^{us} minutissimus, 3^{us}, 4^{to} paullo longior, 5^{us} 3^{to} vel 4^{to} paullo longior, ceteri ad apicem præcedentibus longiores compressi, prothorax capite longior et angustior, lateribus spinis, 2^{us} armatis et inter spinas dente obtuso instructis elytra prothorace latiora parallela apice rotundata incrimia femora pedetentim vix tumescentia

Sp *D obliqua* Antennarum articuli 1^{us} et 2^{us} nigri, 3^{us} 4^{us} et 5^{us} lutei apice nigri, ceteri fusci scutellum albidum elytra sordide testacea fasciis binis abnormibus nigris Corp long 525 unc, lat 175 unc

Exemp 1 in Mus D Children

Habitat Nova Hollandia

Genus PHLYCTÆNODES Newman

Caput exsertum, vix pronum maxillæ mandibulis valde longiores antennæ 11-articulatae, articulus 1^{us} paullo tumidus 2^{us} subglobosus, ceteri longitudine fere æquales ultimo breviori prothorax dorso 4-spinosus spinis 2 anticis acutis paullo retrorsum curvatis 2 posticis vix acutis nullo modo curvatis lateribus 1-spinosus spina mediana acuta retrorsum curvata elytra parallela prothorace latiora, apice obtusa inermia femora pedetentim tumida

Sp *P pustulosa* Fusco niger concolor, caput, prothorax et elytra pustulis—basin majoribus apice minutissimis—crebre tecta (Corp long 12 unc, lat 3 unc)

Exemp 1 in Mus D Children

Habitat Nova Hollandia

Genus TESSAROMMA Newman

Caput exsertum, porrectum, antennæ graciles corpore vix breviores 11-articulatae, articulus 1^{us} pyriformis, basi constrictus apice tumidus, 2^{us} brevis obconicus, ceteri fere lineares 3^{us} 2^{do} paullo longior, 5^{us} et æquantes 3^{to} paullo longiores oculi 4, anteriores majores prothorax capite angustior elongatus, dorso gibber spinis 2 lateribus spina mediana armatus elytra prothorace quadruplo longiora vix duplo latiora, parallela apice extremo oblique abscissa, femora apice repente tumescunt

Sp *T undatum* Testaceum, fusco variegatum lanugine serica splendidum, antennæ et pedes testacei femora et tibiæ fusco cincta (Corp long 8 unc, lat 15 unc)

Exemp unie in Mus D Turner

Habitat Nova Hollandia "Exemp unie prope Adelaide, sub cortice,

inense Junio lectum, vivens formosissimus coloreque fulgoreque

A H Davis

Genus RHAGIOMORPHA Newman

Caput exsertum porrectum, antennæ filiformes longitudine corpus æquantes, 11 articulatæ articulus 1^{us} elongatus, arcuatus, apice tumidus 2^{us} minutus cæteri graciles, longitudine fere æquales prothorax capite haud latior dorso tuberculis 4 fere confluentibus instructus, lateribus medio gibberis in spinam obtusam productis elytra prothorace latiora linearia apicibus rotundatis femora manifeste ac pedetent in tumida

* Species normales

Sp 1 *R. Iepturoides*

Stenocortus Iepturoides, Boisduval, Faune de l'Océanie p 479

Exemp in Mus D Gory, Dupont, et Buquet

Habitat Nova Hollandia Apud Port Jackson lectum

Sp 2 *R. concolor*

Stenoderus concolor, MacLeay Appendix to King's Voyage, vol II p 451

Exemp unie in Mus D Children Descriptio vix distincta

Habitat Nova Hollandia

Sp 3 *R. sordida* Fusca, lunigine argenteo sparsim vestita, caput inter antennis excavatum, punctum prothoracis dorsum longitudinaliter impressum singuli elytri lineæ vix elevatæ 3 femora basi pallidiora (Corp long 5 unc lat 1 unc) antennæ desunt

Exemp unie in Mus D Turner

Habitat Nova Hollandia "Exemp 1 prope Adelaide lectum" A H Davis

** Species aberrantes

Sp 1 *R. oculifera* Caput exsertum lineâ longitudinali impressum, antennarum articuli 1 et 2 nigri, 3^{us} hirsutie exteriori rufa ornatus, 4^{us} et sequentes picei prothorax lateribus lanugine aurea vestitus elytra quasi reticulata, 4 carinata, carina prima macula rotunda lanuginosa aurea interrupta est et ante apicem desinet, 2^{us} 1^o longior fere ad apicem desinens inter 1^{am} et 2^{am} lineâ aureâ, lanuginosa, basalis apparct, 3^{us} ad humerum oritur et longe ante præcedentes desinet, 4^{us} infra humerum oritur et ante apicem 2^o conjungitur mesosternum utrinque lineâ lanuginosa argentea signatum (Corp long 7 unc lat 1 unc)

Exemp 2 in Mus Brit

Habitat Nova Hollandia

Genus STENODERUS, Dejean

Sp *grammicus* Pallide ferrugineus oculi nigri prothoracis latera fusca singuli elytri margo suturalis lineæque tres elevatæ albida, lineâ prima ad marginem suturalem, secunda ad lateralem, in medio tendit Corp long 4.25 unc, lat 0.75 unc

Exemp 3 in Mus D Turner

Habitat Nova Hollandia "Exemp 3, prope Adelaide lectum" A H Davis

V — *Description of Limncus involutus, Harvey, MS* By
W THOMPSON, Vice-President of the Natural History So-
ciety of Belfast, — *with an account of the Anatomy of the*
Animal By JOHN GOODSIR, Esq

[With a Plate]

Limneus involutus, } Harvey, MS
Amphiplelea involuta, }

SPEC CHAR Spine sunk within the outer whorl, aperture
very large, extending to the apex

The finest specimen I have examined is $5\frac{1}{2}$ lines in length,
and $3\frac{1}{2}$ in breadth, volutions four, the largest enveloping the
other three, of which none are visible in the profile of the
shell, aperture very large, wide at the base (exposing the co-
lumella throughout its entire length) and extending to the
apex of the shell, margin reflected only where it joins the pil-
lar Shell polished, of a pale amber colour, extremely thin,
with coarse longitudinal striae

This species approaches the *L glutinosus* more nearly than
any other native *Limneus*, but from the circumstance of the
aperture extending to the apex, has at a cursory view as great
a resemblance to the *Bulla Akera*, Mont, as to any other Bri-
tish shell, a coincidence which is rendered still more remark-
able by the columella presenting the same appearance in the
L involutus as it does in that species

The discovery of this new and beautiful mollusk is due to
my friend Wm H Harvey, Esq (well known for his botanical
investigations) who obtained a few specimens in a small alpine
lake on Cromaglun mountain, near the celebrated lakes of
Killarney, in the month of April 1832

The above account was read to the Linnæan Society of Lon-
don in April 1834 To the present time (Sept 1839), I have
not heard of the occurrence of the species in any other locality
in Ireland The original station was visited by Mr R Ball
and myself in June 1834, when we procured only a few small
specimens The time was however unfavourable for seeing
these mollusks to any advantage, being at a very early hour in
the morning, before the warmth of the sun had tempted them
to leave the bottom of the lake or adjoining rivulet

This shell, from partaking more of the form of the marine

genus *Bulla* than of the other *Limner*, seemed so highly interesting, that I conceived that the mere description of it would be of comparatively little value without that of the animal. Its dissection was most kindly undertaken by Mr Goodsir, to whom I am indebted for the following description, and the admirable drawing which illustrates it.

‘ In structure the *Limnæus involutus* resembles the other species of the genus. When its organs are compared with those of the *L. stagnalis* as described and figured by Cuvier, they are found, with the exception of the nervous collar, and the reproductive organs, to be nearly identical in arrangement and structure (Plate I fig. 2.)

“ In his memoir on the *Limnæus* and *Planorbis*, Cuvier describes the supra-œsophageal portion of the nervous collar as consisting on each side of three small globules, connected mesially by a narrow portion, of an infra-œsophageal ganglion composed of three masses, and of a small ganglion at the junction of the buccal apparatus and gullet. In the *L. involutus* the nervous collar presents the following arrangement (fig. 3.) On each side of the gullet and buccal mass, there are two fusiform ganglia (*a a*), connected superiorly by a straight narrow commissure (*b*), and inferiorly by four small lateral (*c c c c*) and two large median ganglia (*d d*). Anterior to these and concealed by the buccal mass are two large ganglia (*e e*), connected mesially to one another, and laterally to the middle of the lateral ganglia (*a a*), having no connection with the six posterior ganglia. The masses (*a a*) give off near their anterior extremities two nerves, which run forward along the inferior surface of the buccal apparatus, and terminate in two small ganglia (*f f*), which are connected by a filament, and distribute nerves to the buccal mass and œsophagus. The lateral ganglia therefore have one superior commissure, consisting of a simple cord, and two inferior commissures, the posterior containing six ganglia, the anterior two. The lateral and the six posterior ganglia give off all the nerves described by Cuvier, the two anterior connecting masses supply the muscular bundles in their neighbourhood.

“ The arrangement of ganglia described above is not peculiar

to this species, as it exists also in the *L. Peregrin* , and one similar but more complex has been described and figured in the 'Annales des Sciences Naturelles' for 1837, page 112, by Vanbeneden as existing in the *L. glutinosus* . Vanbeneden describes a median between the two large anterior ganglia, and another between the two small stomato-gastric ganglia.

"Cuvier in his memoirs on the *Limnæus* and on the other gastropod mollusks, mistook the testicle for the ovary, and consequently reversed certain of the other reproductive organs. Prevost of Geneva, in a paper published in the Transactions of the Physical and Natural History Society of that place for 1828, and in another contained in the 'Annales des Sciences Naturelles' for 1833, pointed out this error, and described the very beautiful structure, by means of which the seminal fluid is conveyed along the cavity containing the eggs, without coming in contact with them. This structure may be distinctly seen in the *Helix aspersa*, in which it consists of a groove, with the orifice of the duct at both extremities, running along the inner surface of the oviduct. When the fluid is passing from the testicle this groove is converted into a temporary tube by the close apposition of its lips, a structure similar to the groove in the true ruminating stomach. The arrangement of the reproductive organs in *L. involutus*, although different from that described by Cuvier in the *L. stagnalis*, is yet similar to that given by Prevost. The testicle, *a*, fig 2 which is situated in the extreme whorls of the shell, sends off a duct, which has attached to it in the middle of its course, small follicles (*b*) of the same diameter as itself, which appear, if carelessly examined, like duplications of the tube. The duct then becomes closely connected with the point of junction of the ovary and oviduct, runs along the latter for a short distance, and opens into the acute extremity of an oblong sac (*c*), which is closely but not intimately adherent to the oviduct. This sac appears granular from the follicular arrangement of its inner surface, it is bulbous at its anterior extremity, near which it sends off the second division of the seminal duct (*d*), which running along the terminal extremity of the oviduct, at length leaves it, and dives under the transverse muscles (*e*) of the foot, as described by Cuvier in *L. stagnalis*, again

appears near the root of the male organ (*f*), where it is coiled up, and before terminating in the penis presents a small dilatation

“The female organs are an ovary (*g*) which lies across the middle of the body, and an oviduct (*h*) which is dilated and sacculated transversely along its middle third. The vesicle (*i*) found in this situation in the gastropod mollusks opens by a short neck at the termination of the oviduct

“JOHN GOODSIR”

VI — *On certain Characters in the Crania and Dentition of Carnivora which may serve to distinguish the subdivisions of that Order* By G. R. WATERHOUSE, Esq *

JUDGING from the form of the skull and lower jaw, and from the structure of the teeth, the order *Carnivora* appears to consist of six families, of which the Dog, Viverra, Cat, Weasel, Bear, and Seal afford familiar examples, of these the Cats and Weasels appear to be the most truly carnivorous, and the Bears the least so

To these six families Mr Waterhouse applies the names *Canidae*, *Viverridae*, *Felidae*, *Mustelidae*, *Ursidae*, and *Phocula*

In the first of these families (the *Canidae*) the muzzle is elongated the bony palate terminates in a line with the hinder margin of the posterior molars, or even in advance of that line, and in this respect differs from other *Carnivora*, the posterior portion of the skull is short, and there are two true molars on either side, both of the upper and lower jaw

The principal genera contained in this family are *Canis*, *Fennecus*, *Lycaon*, and *Megalotis*. In the form of the lower jaw, and in dentition, the last-mentioned genus affords a most remarkable exception to the other *Carnivora*, and the palate terminates behind the line of the posterior molars, there may be some doubt therefore as to its real situation

The *Viverridae* have the same general form of skull as the *Canidae* but differ in having the posterior portion more produced, the bony palate is carried further back, and the small back molar observable in the lower jaw of the Dogs is here wanting, they have, therefore, but one true molar on either side of the lower jaw, and two true molars on each side of the upper jaw

To this family belong the genera *Paradoxurus*, *Cynogale* (which

* Communicated to the Zoological Society, Sept 21, 1839

is the *Potamophilus* of Muller and *Lamictus* of De Blainville), *Amblodon*, *Hemigaleus*, *Herpestes*, *Cynutis*, *Ryzæna*, *Crossarchus* (the three last being divisions or subgenera of *Herpestes*, in which there is a complete bony orbit), *Liverra*, *Genetta*, *Prionodon*, and *Cryptoprocta*

The Hyæna, Mr Waterhouse is inclined to regard as an aberrant form of the *Vuerridæ* in the general characters of the cranium, and especially in the curved form of the lower jaw, it differs considerably from the Cats (with which it has by some been associated), and approaches the *Viverras*. If, however, it be placed with the *Vuerridæ*, it will form an exception, as regards its dentition, having but one true molar on either side of the upper jaw. The 'carnassière' has a large inner lobe, and in this respect also resembles the *Viverras*, and not the Cats.

The species of the family *Felidæ* may at once be distinguished by the short rounded form of the skull, combined with the straightness of the lower margin of the ramus of the lower jaw, and the reduced number of the teeth, especially of the true molars, of which there are none in the lower jaw, and but one in the upper, and that very small.

This family contains the genus *Felis*, species of which are found in all quarters of the globe, Australia excepted. The Cats appear to bear the same relation to the *Mustelidæ* as the Dogs to the *Viverridæ*.

The *Mustelidæ*, like the *Felidæ*, have the muzzle short and obtuse, the skull, however, is more elongated. They may be distinguished by there being one true molar on either side of each jaw, that in the upper jaw is well-developed, and generally tricuspid, but in some, such as the Badger, it is longer than broad. In the Otters, Skunks, and American Badger (*Taxidea Labradorica*), the true molar is intermediate in form between the common Badger (*Meles vulgaris*) and the more typical *Mustelidæ*. The false molars in the Weasels (*Mustela*) are typically $\frac{3-3}{4-1}$, but in some species they are reduced to $\frac{1-1}{3-3}$. As in the *Felidæ*, the angle of the lower jaw, in the greater portion of the *Mustelidæ*, is on the same plane as the lower edge of the horizontal ramus. In other *Carnivora* it is raised. In this family there is a great tendency in the glenoid cavity of the temporal bone to inclose the condyle of the lower jaw. The condyle is more truly cylindrical, and longer than in other *Carnivora*. In the Dogs there is no trace of the anterior descending process of the temporal bone which in the *Mustelas* confines the condyle of the lower jaw.

in other *Carnivora* there is always a slight trace of this process, but in none does it inclose the condyles, as in most of the *Mustelidæ*

The genera contained in this family are *Mustela*, *Zorilla*, *Galictis*, Bell (which must not be confounded with the *Galictis* of Is Geoffroy St Hilaire, published in the 'Comptes Rendus' for October 1837, p 581), *Mellivora*, *Ursitatus*, *Helictis* and *Gulo*, in which the true molar of the upper jaw is transverse, *Lutra* and *Mephitis*, in which this tooth approaches more or less to a square form, *Laiidea* in which it is triangular, and lastly, *Melus*, *Arctomys* and *Mydaus*, in which the true molar is longer than broad. This last-mentioned genus evinces an approach to the order *Insectivora*

In the *Ursidæ* there are two well-developed true molars on either side of each jaw the 'carnassière' here has changed its function, not being suited, as in other *Carnivora*, to cutting flesh. The palate is considerably elongated. In the Bears (*Ursus* and its subgenera) it is small, being robbed as it were of its nutriment by the true molars, which are very large. In the other *Ursidæ* (*Procyon*, *Nasua*, *Cercopithecus*, *Arctictus* and *Ailurus*), the 'carnassière,' especially that of the upper jaw, and the true molars, are nearly equal in size, and also nearly resemble each other in other respects*

In the true Bears the form of the lower jaw differs from that of any of the preceding *Carnivora* in having a projecting process on the under side of the ramus, and situated a little in advance of the angle of the jaw. The same character is also found in many *Scals* (*Phocidæ*), which in several other respects appear to approach the Bears

VII —Summary Description of Four new Species of Otter By B H HODGSON, Esq, Resident at Catmandu, Nepal†

ONE of the most remarkable features of the mammalogy of Nepal is the great number of distinct species of *Otter* characterizing it. There are at least seven species, I believe, though not one of them is numerous in individuals, at least not in comparison of the common Otter of commerce, which is produced in the neighbourhood of Dacca and Sylhet. This rarity of species, added to the circumstance of the animals not being regularly hunted for their skins, renders it very difficult to procure live specimens, and without live specimens

* "From an examination of the external characters of *Bassariscus astuta*, it appears to me that it belongs to this group."

† From the Asiatic Journal, No 88, p 319

—which may be slain and their osteological as well as other characters thus accurately examined—the discrimination of specific differences is a work of extreme labour and delay. Many years ago I announced to Mr Bennett, the late Secretary of the London Zoological Society, the fact that there are several species of *Lutra* in Nepal and before he died he was nearly convinced of the correctness of the statement though I could not then, nor can now give a full exposition of even those with which I am best acquainted. Waiting however for the perfect knowledge when the materials of it are not under command as I find, like waiting on the river side for a dry passage after the waters have flowed past, and I shall therefore offer no apology for briefly characterizing those four of the seven Nepalese species of Otter of which I have considerable certainty leaving the remaining three to some future occasion

GENUS LUTRA

1st Species—TARAYFENSIS NOBIS

Size, medial *Structure* typical. Skull and head much depressed. Lower incisors ranged nearly in line. Tail equal to two-thirds the length of the animal and much depressed. Form robust. Nails compressed, exerted from the finger ends, and acute. Fur short and smooth. *Colour*—above, clear umber below, and the hands and feet pure yellowish white, the yellow tint deepest on the limbs the pale colour on the head and neck extending upwards to the line of the ears—less so on the body, and the distinction of dark and pale hues very decidedly marked. Tail above and below, dark

2nd Species—MONTICOLUS NOBIS

Size, large. *Structure* upon the whole similar to the above. Tail equal to more than two-thirds of the animal, and less depressed. Skull and head less depressed. Intermediate incisors of lower jaw ranged entirely within or behind the line of the rest. *Colour*—above deeper than the above, or bistre brown, below, sordid hoary, vaguely defined, except on the edge of the lips and chin, limbs nearly as dark as the body. Fur longer and rough, or porrect from the skin in a considerable degree

3rd Species—INDIGITATUS NOBIS

General form and proportions of *Leptonyx*, to which it is affined. Habit of body more vermiform than in the above. Tail but half the length of the animal. Toes very short, and more than half buried in the palmary mass. Nails short and worn but not depressed nor

truncated, as in *Leptonyx* Size medial Colour—same as in the last, but deeper still, or dusky bistre paler and ruddier on the body below, and albescent on the head below but the colours not well defined, and only really distinct (except in shade) on the inferior surface of the head Character of the fur as in the last and indeed in all the mountain species

4th Species—AURO-BRUNNUS NOBIS

Size, small Habit of body still more vermiform Tail less than two-thirds of the length of the body Toes and nails fully developed Fur longish and rough as before Colour—rich chestnut brown (the fruit) above and golden red below and on the extremities

Remarks —The three last species are confined to the mountains as is the first species to the plains at their foot The dimensions in inches, and the weight of the four species are as follow —

	1	2	3	4
Lip of snout to base of tail }	26 to 28	30 to 32	22 to 24	20 to 22
Tail	16	20	10½	12 to 13
Weight	16 to 20 lbs	20 to 24	11 to 13	9 to 11

I am Sir,

Your obedient servant

Nepal, May 1829

B H HODGSON

VIII — *Information respecting Botanical Travellers*

Mr Schomburgk's recent Expedition in Guiana

[Continued from p 434 of vol 15]

THE Yamanack of the Creoles or Wawula of the Arawaaks, may be considered the representative of the Madagascanian *Lemur* in Guiana It is the *Potos caudivolvulus* of Desm, or *Cercoleptes caudivolvulus* of Illiger Its general appearance is so much like a *Lemur* that it has been classed under that family In its sanguinary disposition, its teeth and feet, it resembles the feline race, from which it differs however in its slightly prehensile tail, which is considerably longer than the body The hind legs are a little longer than the fore, and they walk altogether on the soles and palms They carry their food with the fore paw to the mouth, and are expert climbers Their prehensile tail is of great advantage in climbing trees when in search of honey, their fur and skin being apparently impervious to the sting of bees They feed likewise upon young birds, eggs, and mice, they pass the day in hollow trees and

stir out only by night. The glare of the day appears painful to their eyes. Those which in a tamed state are exposed to it, appear uncomfortable and slow in their movements, while in the dark they are all dexterity. I have seen several in a tamed state, which when awakened in the day seemed uncomfortable and rolled themselves up again to sleep. Its tongue is long. This organ is therefore admirably qualified for sucking honey. When tamed it appears partial to syrups or any other sweets, but indeed nothing comes amiss to it, and it feeds as well on meat, yams &c. as on fish.

They are more common at the sea coast, but inhabit likewise the Savannahs. The Macusi Indians of the Savannahs call it Yawari. The Warraus at the sea-coast Uvari.

Those coppices of wood which rise from amidst the Savannahs like verdant isles from the bosom of a lake are the favourite abode of an animal which, if we except its plantigrade feet, approaches in its habits and appearance our martens. It is the *Gulo* of authors.

We observed two species in Guiana, the larger of which may be identified with the *Gulo barbarus*. The size of the individual from which the following description is taken, was two feet from the tip of the nose to the insertion of the tail, the latter being eleven inches. The head was broad and compact, the ears short and round, the back arched, the tail low and bushy, the legs thick and strong, especially the fore feet, which were somewhat shorter than the hinder. The head is gray, the fur above deep brown tipped with white, all the rest of the body is of a deep shining black, with the exception of a large whitish-yellow spot on the breast, which contrasts strongly with the other colours. It possesses the peculiarity of being able to erect all the hair of its bushy tail at pleasure.

The whole appearance of these animals bespeaks strength, and their toes being armed with crooked nails, they have every requisite for indulging in their sanguinary habits. Their principal food are small animals, as mice, rats, birds, and insects, but they also feed on fruit and are partial to honey. As they are expert climbers they plunder the nests of the wild bees, and like the Coati or *Nasua*, are able to run down a tree which grows perpendicular, head foremost. They feed by day, and generally betake themselves to a hollow tree for their night quarters. Here they likewise seek refuge when hunted. They are found more commonly on Savannahs than elsewhere, and only occasionally in the forest, they never seek their food near human habitations. They are sometimes tamed, and are then gentle and playful, but they are easily excited and when preparing for defence or war they erect the hair of their tail. They

possess the skill of cats in spying out and destroying rats and mice, which from their long slender shape they are able to follow better to their retreat than the former. Two glands which are situated near the anus contain a fluid which possesses a disagreeable odour. The animal is called by the Arawaak Indians *Ilacca*, by the Macusi *Maikano*.

The Grisons have been divided from the true Wolverines (*Gulo*) and Mr Bell has formed the genus *Galictis*. Guiana possesses two species, namely *Galictis vittata* and *G. Allamandi* of Bell. The *Galictis vittata* or Petit Frurat of Azara inhabits the mountainous districts where the Essequibo has its sources. I saw the first in a tame state at a Woyawai settlement in the Acaia mountains. It measured about 16 inches from the tip of the nose to the insertion of the tail, the latter being 6 inches long. Its colour is of a light-brown on the back, but near the head it is of a pale gray colour mixed with black. The muzzle, throat, chest, and body underneath are of a shining black.

The claws are strong and sharp and the toes are half connected by a membrane. In its tamed state it lived on boiled fish, meat, fruits, yams &c, but in the forests it subsists on birds, reptiles, and small game. It feeds during day, and selects the hollow of a tree for its abode during night.

The second species, *Galictis Allamandi*, Bell*, is equally scarce in Guiana but it is occasionally met with near the sea coast in Demerara. It is somewhat larger than the *Galictis vittata*, its total length is about $2\frac{1}{2}$ to 3 feet, and although it exhibits the same general character, it differs widely in its colouring. The fur on its back is at the base of a deep black, and the points are white, the muzzle, lower jaw, throat, and part of the belly are of a shining black. A whitish line extends from between the eyes over the ears to the sides of the neck. In a state of nature it is said to be ferocious, and it is more difficult to tame it even when taken in a young state than the *Gulo barbarus*. I have been told of one which was kept on board of a colony schooner, this is however the only instance which came to my knowledge where it had been reconciled to a domesticated state.

The specimen which I possess in my collection appears to be the young of *Galictis Allamandi*, the hairs on its back are more of a silvery gray than in the adult but there are no specific differences.

Both species are alike in their habits, and, aware of their inca-

* Vide Mr F. Bell on the genus *Galictis* Trans. Zool. Soc. vol. II Pt. 3, p. 201.

acity to overtake their prey by swiftness, they resort to stratagem. When pressed by hunger they do not despise carrion. The *Gulo barbarus* and *Galictis vittata* which I have seen in a tame state, had the greatest aversion for water. I recollect the boys at the Woyawai settlement amused themselves with carrying the tame *Galictis vittata* to the banks of the brook. It availed itself of the first opportunity to escape and if it had wet its feet, it used the same manoeuvres as a cat to get rid of any moisture which might have remained on it. The *Gulo barbarus* is equally fearful of the water. If, therefore, naturalists have observed any resemblances between the Grison and the Otter, this does not refer to their habits. It may resemble the bear in its gait and semi plantigrade feet, but there exists no further affinity, while at the first glance, its slender body, the shortness of its legs, the softness of its fur, its dentition and sanguinary habits, and not least the strong odour, point to the typical *Mustelida* with regard to the position which the Grison ought to occupy.

Our tents were pitched on the 9th October, 1838 at the foot of a hillock, the summit of which was crowned by a remarkable natural column known to the Macusi Indians under the name of Pourae Piapa, or the felled tree, from the resemblance which it bears to a trunk of a tree deprived of its leafy crown. While we were ascending the hill for a nearer inspection of this wonderful freak of nature the Indians had set the Savannahs on fire. A general bustle of those who had remained in the camp attracted my attention. I saw the men armed with bows and arrows and accompanied by their dogs under full cry in pursuit of some game. The chase was of short duration, and when reaching the spot where the pursuers had come to a stand I found that an Armadillo of gigantic size, which no doubt had been chased by the flames from its retreat, had caused the commotion. It was lying there a round misshapen mass, its head partly buried under its armour, the feet drawn together, and its body pierced by numerous arrows. Ever and anon the barking dogs inflicted new wounds, or another iron headed arrow was sent through its shell into the flesh of the poor animal which offered not the slightest resistance to its tormenters, and I do not know how long they would have continued to inflict new tortures if I had not desired them to end its sufferings by the heavy stroke of a club.

I continued my visit to the Pourae piapa with the intention of taking the dimensions of the Armadillo after my return to the camp, in this I was however disappointed, when I arrived there it was cut

up, and parts of it were already boiling in the pots of the Indians, not for the purpose of eating it as the Macusi abhors the flesh of this species of Armadillo, but for the sake of extracting its fat or oily substance

I estimated its weight from 110 to 120 lbs * its height about 3 feet its length $5\frac{1}{2}$ feet Its tail was about 14 to 16 inches in length, and its root nearly as thick as a man's thigh tapering very abruptly The fore foot had five toes the middle one of which was $7\frac{1}{2}$ inches in length These are the only details which I can offer of a species which in its size surpasses the largest giant Armadillo known (*Dasypus giganteus*, Desm) As far as I recollect, the head was comparatively small, but as I intended to have it inspected more closely on my return I have mentioned only such circumstances as have fixed themselves in my memory and which I wrote down after my intentions were frustrated by the Indians I cannot pretend to assert that it is a different species from *Dasypus giganteus*, but its enormous size will attract the attention of naturalists and geologists to the fossil genera which if compared with the existing species will not offer so great a difference in size The Macusi Indians in our train named it MAOURAIMA, the Wapisianas MABURA, the War-raus OKAIYÉ, the Arawaaks IASSI O HARA

I possess from Mr Vieth, the following note of a species which I do not doubt was the *Dasypus giganteus* "I stuffed at Devonshire Castle Plantation in Demerara an Armadillo which weighed 70lbs but I did not take its dimensions, and eight years having since elapsed, the present description is entirely from memory The shell may have been 2 feet to $2\frac{1}{2}$ feet long, and its total length about 5 feet, of which the tail was about 2 feet The shell was very thick and hard covered with scales of different shape On the belly and those parts where it was without scales were a few scattered hairs, the claws on the fore feet were very long and strong The tail which was covered with the same kind of coat of mail as the back was about 3 inches in diameter, at the root gradually tapering to a point The back and all those parts which had the scaly covering were of a horn colour the under part, which was without scales whitish As it was killed by Negroes near the coast I could not procure the Indian name "

The third species in size is the *Dasypus encoubert*, Desm with six or seven bands It appears to be very common at the savannahs which extend between the rivers Berbice and Demerara

* Two men were required to carry it when they took it to our halting place

The fourth species with which I am acquainted is the *Dasypus Peba*, Desm with from seven to nine bands. It is the most common in Guiana and found as well at the coast region as in the interior. Its length is about 18 inches, and the tail is as much more. The head, back, and tail is covered with scaly armour like its congeners. The belly under part of the head and throat, legs and thighs are covered with a whitish skin, set with a few scattered hairs. The claws are strong and these animals can dig with so much ease that there is little hope of taking them without great exertions by digging after them*. They bear eight or nine young at a time, which follow the mother like young pigs. The young are blind at their birth.

The principal feeding time is in the night, but they go sometimes abroad in the day. Their food consists generally of worms and insects. In a tame state they readily eat farinaceous food and also roots. They are called by the Arawaaks IASSI which is the general name of the Armadillo.

The Savannah Armadillo is Desmarest's *Dasypus villosus*, and as we were assured by the Indians, it inhabits only the plains and is never to be met with in the forest. The Indians accuse it of feeding occasionally on carrion†. It is distinguished by its being more flat in shape than the others, and by the numerous hairs which cover as well the shell as the body.

Among my collection is a specimen of the *Dasypus tatouay* of Desmarest, which was procured at the coast regions at Demerara. Its claws, of which there are five on the fore feet, are very large in proportion. It has from 12 to 13 moveable bands. The tail is round short, and covered with a few tubercles. Its ears are large and erect. The head resembles *D. Peba*.

The IASSI Baracatta of the Arawaaks is the smallest Armadillo in Guiana (*Dasypus minutus*, Desm.), its body is about 10 inches and covered with numerous brown hairs. Its geographical distribution extends over the southern half of South America.

* Mr Waterton, in his amusing Wanderings, p 166, tells us "that the Indian, to prevent disappointment when discovering a hole where he supposes an Armadillo to have taken up its abode, carefully examines the mouth of the hole, and puts a short stick down it. Now if on introducing the stick a number of musquitos come out, the Indians know to a certainty that the Armadillo is in it, where there are no musquitos in the hole, there is no Armadillo."

† The Indians on the Rio Branco gave us the same information, and at their dances they sing to that effect, that when once dead their relations should only throw them on the savannahs, where the Armadillo would bury them.

I have enumerated seven species of Armadillos which I know to inhabit Guiana. They resemble each other in their habits and appearance, and their form, number of claws, and dentition give to the naturalist the specific difference. The number of bands of which their armour consists is so variable in different individuals of the same species, that the systematic naturalist should not attach the slightest value to it.

They all burrow, and their general food appears to be worms and insects, they sometimes commit depredations in the provision grounds, and the giant and savannah Armadillo are said to feed on carrion. All Indians agree in this assertion.

When about to bring forth the mother is said to make a nest in the burrow and gives birth to from seven to nine young, which are blind. They afterwards follow the mother who whilst the young ones are still helpless, never ventures to leave their hole by day. They feed generally by night, but from the circumstance that we have secured several in the daytime which we found walking it may be concluded that hunger forces them sometimes to go in search of food during the day. Their walk is swift, but they can neither run nor leap nor climb. If pursued therefore without being able to reach their hole, they roll themselves more or less up and submit to their fate without defence.

The smaller species are eaten by all the Indians and are considered a delicacy. The Arawaak Indians are the only tribe whom I have ascertained to eat the giant Armadillo. The *Dasypus Peba*, or common Armadillo, is even esteemed by many Creoles, and its flesh is white and tastes somewhat like rabbit, we may therefore suppose that they receive no mercy. As they are seldom found from their retreat, nor stir out except by night the pursuit of them requires some skill and patience.

I myself have seen that when pursued and they are far from their retreat, they begin digging a fresh burrow, and when half buried and laid hold of by the tail, it is so difficult to pull them backwards that they often make their escape with the loss of their tail. Their pursuers sensible of this, avoid dragging the tail with all their force, while another tickles it behind with a small stick, upon which they relinquish their hold and are secured.

[To be continued.]

BIBLIOGRAPHICAL NOTICES

A History of British Ferns By Edward Newman, F L S London,
Van Voorst 8vo .

WE rejoice to find that Mr Van Voorst is not confining the valuable series of Natural History works which is issuing from his establishment to zoology and beg to congratulate him upon the beauty of the first botanical portion of the collection

The ferns have long attracted the attention not only of botanists but of all admirers of nature by their great elegance and indeed we know of nothing more worthy of admiration than a lofty hedge bank such as may be often seen in the western parts of England, covered by these beautiful plants of numerous species, of all sizes and in different stages of growth We have often been asked to point out some work which, combining a popular account with scientific descriptions and characteristic figures, should be equally fitted for the drawing-room or the study, for the amateur or the botanist, and have been compelled to acknowledge that no such book existed These requisites are at length answered by the work before us, which we are quite convinced cannot be surpassed in the elegance of its numerous figures, equally deserving of praise for their beauty and correctness, and claiming our admiration by the completeness of its account of each species, and the philosophical views and pure love of science displayed in it

Agreeing as we do with the author in most of his conclusions, we think it right to state a few points in which, in our opinion, the work admits of improvement We consider the want of any distinct specific characters as a great imperfection, for although the distinctive points are fully stated in the account of each species yet much difficulty is thereby introduced into the determination of the several plants More exact references to the works of authors quoted, and the introduction of authorities for those localities in which the author has not himself seen the plants growing, even though he may have had specimens before him, would have been desirable

A large portion of the introduction is occupied by an account of Mr Ward's plan for growing plants in closed cases, a plan deserving of much greater attention than it has yet received, from its value in causing the healthy growth of ferns, heaths, saxifrages, and other plants in the centre of the smoky atmosphere of London, its use in promoting the successful transport of plants by sea, and its elegance when employed as an ornament of the drawing-room

Great stress is laid upon the venation as affording the best ge-

neric characters for ferns, and it cannot be denied, that the form, situation &c of the veins assist greatly in distinguishing allied genera, but yet we must express our dissent from the author's opinion, when he says that he "is inclined to believe, that henceforth in the veins* of a new fern will be sought the characters which shall decide its genus" and on this subject we cannot do better than quote an observation of the younger Agardh, contained in his recently published *Recensio specierum generis Pteridis*. He says, "Ex una enim facile altera oritur venarum configuratio ita ut per seriem specierum maxime affinium a simplicissima ad compositam structuram sæpe progrediunt venæ, unde species sæpe maxime affines in diversa genera divellerentur," and afterwards he adds, 'Ubi itaque apparen- ter ex una altera oritur venarum configuratio, hoc caractere tantum innisa genera, summa injuria me judice conduntur. Ad divisiones vero generum extruendas, venarum decursus et distributio, meo judicio optime adhibentur' "

Numerous changes have been made in the nomenclature of the plants, but in all cases the oldest name has been adopted and no new ones are introduced, the localities of each species are given in sufficient detail, and the illustrations are remarkably numerous. In the genus *Woodsia* the species are combined nor do we know of any certain character by which to distinguish them. In *Cystopteris* also we quite agree in reducing the *native* plants to one species, a careful study of them in a wild state having convinced us that they can only rank as varieties. *C. regia*, Smith, we consider as distinct, but as not having a valid claim to be included in the British lists. We now come to *Polysticum* (*Aspidium*, Sm.) *lobatum*, *aculeatum*, and *angulare*, and here again we agree in most points, but differ from Mr Newman in believing that the Linnæan *P. Lonchitis* is really the same as the Irish and Scotch plant known by that name, and probably distinct from the protean *P. aculeatum*. *Aspidium dilatatum*, *spinulosum*, and *dumetorum* of Smith are, we think, rightly combined, although several of our most eminent botanists consider them as truly distinct, depending chiefly upon the form and direction of the frond, the position of the upper surface of the pinnæ (either in the same plane with the rachis or in different ones,) and upon the much more deeply impressed veins upon the upper surface of the plant usually denominated *A. spinulosum*. See Hooker's Brit Fl ed 4 p 386, note. Mr Newman combines *Polypodium*

* This subject has been recently investigated by Mr Smith of Kew, in a paper read before the Linnæan Society, of which we hope to give an abstract in our next Number.

dryopteris and *calcareum*, but to this we must object as the character taken from the presence of glandular pubescence in the latter may, we think, be always depended upon. We have examined numerous specimens since the publication of Mr Newman's work, and find it constantly present in *P. calcareum*, and always wanting in *P. dryopteris*.

In conclusion, we beg strongly to recommend this volume to the notice of our readers as we are convinced that it is only by an extensive sale that it can ever repay the expense attending its publication.

Itei Hispaniense, or a Synopsis of Plants collected in the Southern Provinces of Spain and Portugal with Geographical Remarks and Observations on rare and undescribed Species. By Philip Barker Webb. 8vo. Paris: Bethune and Plon, London: Coxhead, 1838.

Otia Hispanica seu delectus plantarum rariorum aut nondum rite notarum per Hispanias sponte nascentium. Auctore P. B. Webb. Pentas. I. fol. Paris: Brockhaus et Avenarius, London: Coxhead, 1839.

We crave pardon of our subscribers and of the author for not having sooner noticed these two works, the former of which has peculiar interest from its supplying us with a catalogue of the native plants of a region which has received but little attention from naturalists, and which we fear, from the disturbed state of Spain must long continue to be of difficult access to the student of the peaceful science of botany, and the latter is highly deserving of attention from its splendour and scientific value.

The *Itei Hispaniense* exactly meets our views of the best form in which a local Flora can be presented to the public, that is, that it should be for the most part a mere catalogue of names and localities, referring to the large descriptive works for the specific characters and the greater number of synonyms, but that descriptive critical and geographical observations should be introduced in those cases in which the author supposes that he is possessed of new or little known and valuable information. Several such works have been published of late both in this country and on the continent, and we receive this addition to their number with great satisfaction. The author is well known by the great work which he is publishing in conjunction with M. Sabin-Bertholot under the title of *Histoire Naturelle des Iles Canaries* — a work which we fear has not received that attention from the scientific men of Britain of which it is so highly deserving. The plants are arranged according to the natural

system,* commencing as is now becoming the more frequent plan, with the less perfect plants

We had intended to have given the specific characters of all the new species contained in this book, but find them to be so numerous that space will not allow us to do so we must therefore refer to the work itself, which will no doubt soon, if indeed it is not already be in the hands of all those who are interested in the plants of the South of Europe, only noticing here a few of the more interesting points

Narcissus juncifolius La Gasc Folius filiformibus, rigidis, acutis convolutis scapo gracili, subbifloro, brevioribus, petalis ovato lanceolatis mucronulatis — *N juncifolius alter* Clus Hisp 250
N Jonquilla, Linn Folius angustis carnosius angulosus, obtusiusculis scapo 2—6 floro longioribus, petalis lanceolatis acutis — *N juncifolius prior* Clus Hisp 250

The latter of these plants which is the Jonquil of the gardens has not been noticed in its native locality since its first introduction into cultivation by Clusius 250 years since Mr Webb finds it upon the grassy slopes upon either side of the long range of the Sierra Morena to which range of mountains it appears to be entirely confined It is possible however, as suggested by Mr Webb, that it may be found hereafter on the chain of Atlas in the northern part of Africa The former species originally and correctly separated from the Jonquil by Clusius inhabits the warmer and drier parts of the coasts of the Mediterranean

Pages 11 to 15 are occupied by a very valuable catalogue, with extended observations, and in several cases amended specific characters of all the species of *Quercus* (oaks) noticed by the author in Spain and Mauritania consisting of 11 species the last of which, the *Q pseudo-coccifera* Labill, but not of *Desf* is considered as a new species, and named *Q Callprinos*, Webb

Anthemis fuscata, Brot is formed into a new genus, with the following characters and name (page 37)

PLURIDENRA, Webb Involucrum discoideum, imbricatum Flosculi radii ligulati, disci 5-dentati, superiores steriles Receptaculum conicum foveolatum, paleaceum, paleis ad basin latis, fusco-marginatis, tubo corollæ æqualibus, persistentibus, superioribus brevibus, scariosis, caducis Stylis disci ramis appendiculatis Achænium exalatum, subquadrangulare, glabrum striatum, calvum, areola terminali indistincta

Herba littorum maris interni, annua, inodora, glabra, præcox facie Chamæmeli Ramis foliosis, apice moncephalis Radius albus, repandus Folia bipinnatifida, lobis incisis Discus fluctu

mature superne nudus, basi collari seu περιδεραι⁶ palearum persistentium cinctus

Sp 1 *P fuscata*, Webb *Anthemis fuscata*, Brot

At page 48 the *Ulex provincialis*, Loisel, is referred to *U australis* Clemente, as in the opinion of our author the plants are identical, and therefore the older, although neglected name conferred by Don Simon Clemente must be employed

We now come to the magnificent work placed second at the head of this article, of which we believe that the first part alone has as yet been published. It is in folio, and is intended to form a volume containing between 50 and 60 uncoloured plates, with accompanying descriptive letter-press. The present number contains 8 pages of letter-press and 5 plates, representing *Holcus cæspitosus*, Boiss *Artemisia Granatensis*, Boiss, *Cytisus tribracteolatus*, Webb, *Adenocarpus Boissieri*, Webb, and *Salsola genistoides*, Poir. The latter is a very remarkable plant, having all the appearance in habit, &c of a *Genista* combined with the characters of a *Salsola*.

The plates appear to us to be of the highest character, being clearly and beautifully executed with very numerous illustrative dissections, and (as far as we can judge without having the plants before us) they are highly characteristic. We hope to have an opportunity of noticing the successive numbers of this work as they appear, and cannot but recommend it strongly to our botanical readers.

On the Organs of Secretion in Plants. A prize question crowned in 1836, by the Royal Society of Sciences of Gottingen. By Dr F J F Meyen. With Nine Plates. Berlin, 1837.

This Memoir contains a vast number of excellent observations on those organs in plants which possess the property of secreting any substance. A number of admirable drawings illustrate the text. The Royal Society of Gottingen required "an accurate representation of the secreting organs in vegetables with reference to the structure of the secreting parts, and of the effects which secretion in general produces on the process of vegetation." The organs which have the power of secreting have been arranged according to the secretions produced, and the author commences with those which secrete air, he distinguishes between the cavities originating from laceration, and those air cavities or canals formed by the separation of the rows of cells, which may be regarded as widened intercellular passages frequently have septa consisting of a stellate cellular tissue, and allow therefore of free transmission. He then

passes on to the consideration of the vesicles (*Blasen*) in *Utricularia*, the structure of which is accurately expounded. They are at first filled with a slimy liquid, the place of which is subsequently occupied by air. Then follow the ascidia of *Nepenthes*, which likewise when young, contain air only. The secretion of water at the apices and margins of the leaves of many plants is not considered to be a secretion nor could the author find the apertures described by Schmidt, which produce this. In the second chapter those organs are treated of which secrete within the cellular tissue mucus, gum, oil, balsam and resin. The author regards the resin canals as widened intercellular passages, having no epidermis, and whose contents are formed by the immediately adjacent cells. In *Rhus typhina* there is no latical sap (*Milchsaft*) nor vessels, but passages with a liquid resin containing much turpentine. In the *Umbellatæ* there is also evident in summer a formation of passages containing an oily liquid. The oil vessels in the seminal envelopes of the *Umbellatæ* possess the same structure, but are smaller than the former. The mucus and gum passages are of similar origin, but are shorter and without lavigated walls. They occur of a very large size in the *Cactææ*, *Malvaceæ* and *Zamææ*. The glands are treated of in the third chapter in which Guettard's observations are maintained against the views of De Candolle. The author divides the glands into external and internal the former again into simple and compound. The simple are petiolated or nonpetiolated in the first case similar to glandular hairs, here the formation of hairs is shortly touched upon. The petiolated glands of a number of plants are described and in part figured, they are claimed for the *Chenopodeæ*, where they are said to form respiratory and secreting parts, and the glandular cell to be formed last on the hair, even when a compound gland exists on the hair, it is formed last. The simple nonpetiolated glands comprise the *glandes miluaries* of Guettard, or stomata, the author at present confesses that they possess apertures, but that the two cells act like a kind of sphincter (*Schliessmuskel*) and at the same time have the function of glands. Of the compound glands several are accurately represented, among others those of *Dictamnus*, which moreover have a cavity for the secreted matter, those of the hop, the globules contained in which on their exit into the water present an extremely lively and free movement, those of *Ribes*, *Solidum*, &c. The organs secreting a caustic substance in *Urtica*, *Jatropha*, and *Loasa*, and the rotation of the cellular sap in the two latter, are then described, after which follow the compound internal glands without cavities of secretion, when the cells contain small drops of oil or

resin the author terms them Pearl glands (*Perldrüsen*), these occur in *Cecropia Begonia, Piper, Bauhinia, Urtica*, and many other plants. Remarkable is the ascent (*hinantreten*) of a spiral vessel up to the gland in the marginal glands of *Dioscorea*, in this case likewise the cellular sap globules possess motion. The consideration of the nectaries with some reference to Kuri's memoir on this subject, forms the conclusion. The second section treats of the internal glands, they are described and figured from *Dictamnus Ruta, Melaleuca, Citrus, Hypericum Gossypium* &c. The so called glands of the *Labiatae* are treated of in supplementary notes. The fourth chapter relates to the secretion of peculiar substances by individual cells in the interior of the cellular tissue. It is a well known fact, observes the author, that individual cells at times contain a colouring substance which the adjacent cells do not exhibit, the formation of chlorophyll must also be regarded as a product of secretion. In the *Lysimachiae*, it is in some single large cells that the red resinous pigment is situated, which appears to be composed of a number of minute bars (*Stäbchen*). These resinous secretions are exceedingly remarkable in the elongated cells of the parenchyma near the spiral tubes in species of *Aloe*, where at first brown resinous globules occur along with green globules, gradually increase in number, and at last fill in a mass the entire cell. In the roots of the *Valeriana* there are also found, in the outer layers, resinous globules in the cells, a similar occurrence is also described in *Amomum, Curcuma*, and other *Scitamineae*. The fifth chapter is devoted to the consideration of the vital sap or milksap vessels (*Sassa laticis*), the author here endeavours to maintain and confirm his opinion that they possess walls, and are therefore true vessels, he also endeavours to demonstrate the motion of the sap in them although he is not able to establish any result founded on direct observation respecting the terminal extremities and the mode in which the current is carried through the entire plant, he lastly treats of the external structure of the milk sap and its globules, as also of the chemical characters it presents. The sixth chapter contains some concluding remarks the author enlarges on the phenomena in relation to which substances are secreted externally without the existence of any peculiar apparatus, as in the scales of buds, in the aerial roots of *Mais*, in the occurrence of tragacanth, in the efflorescence of sugar on *Algæ*, of waxy substances on fruits and leaves, &c. In this memoir, which contains so great and valuable a mass of information we are glad to find that the author does not give way to a polemical spirit — *Linnaea* Part III 1839

Descrizione di un nuovo Genere di Pianta della Famiglia delle Leguminose di Guglielmo Gasparini Description of a new Genus of Plants of the Family Leguminosæ, by Guglielmo Gasparini

Sign Gasparini has given in a short memoir published separately, a full description of the *Acacia Farnesiana* of which it appeared necessary to form a new genus, from its holding an intermediate place between the genera *Lagonychium* and *Acacia* and forming the transition from the *Mimosæ* to the *Acaciæ*. He terms it *Farnesia*, and thus characterizes it —

Flores hermaphroditi Cal minimus tubulosus 5 dentatus Cor gamopetala minima 5 dentata calyce inserta ac cum ipso coacta Stam numerosa exserta, omnino soluta, antheris minimis rotundatis Pist corollæ subæquale, ovario oblongo, stylo filiformi, stigmate oculo nudo inconspicuo Legumen inde hiscens subteres, subfusiforme, torulosum s seminibus abortis hinc inde constrictum, sessile, primo pulpa spongiosa farctum deinde cellulosum, nempe ex endocarpio semina involuta ac in sepimenta producta in plures cellulas divisum Semina nuda — *F odora*

The plant is described at length, and the flowers and fruit delineated on an annexed plate. This small tree is cultivated in Sicily to decorate the garden, under the names of Gaggia or Cassia. Its flowers are odorous, but the roots have a bad smell which is also imparted to the spittle when the seeds have been chewed. It however, in this case proceeds solely from the radicular end of the embryo — *Linnaea*, Part III 1839

Osservazioni intorno la Durata ed il Germogliamento della Grammite fatte da Guglielmo Gasparini Observations on the duration and germination of *Grammitis*, by Guglielmo Gasparini

The *Grammitis leptophylla*, one of the most frequent ferns occurring on the coast districts of Naples, dies annually towards the end of spring, and shoots forth again in autumn and winter from the spores. The author describes the plant at length, and the process of its germination and development, which, together with the perfect plant, are figured on the first plate. The second plate contains the first stage of development of *Adiantum Capillus Veneris*, *Scolopendrium officinarum*, *Isplenium Adiantum nigrum*, and *Aspidium hastulatum* — *Ibid*

PROCEEDINGS OF LEARNED SOCIETIES

● LINNÆAN SOCIETY

December 17 —Mr Forster, V P , in the Chair

Specimens of the *Lagurus ovatus* collected last summer at Sewer s End, two miles from Saffron Walden, were presented by Mr Cumming, who discovered the plant about three years ago in that locality, which is its only actual English station

Read, ' Description of the Curatá, a plant of the tribe of *Bambuseæ*, of the culm of which the Indians of Guiana prepare their Sarbacans or Blow-pipes ' By Robert H Schomburgk, Esq , communicated by the Secretary

Referring to a passage in Baron Humboldt s " Personal Narrative " of his ' Travels in America ' in which the learned author describes the reeds of which the Indian Blow pipes are made and regrets his inability to determine from what plant they were obtained Mr Schomburgk states it to have been a point of the greatest interest with him in his recent journeys in the interior of Guiana to ascertain this fact He found that the Macusi tribe of Indians obtained these remarkable reeds by barter from the Arecunas who again made journeys of several months duration to the westward to procure them from the Maiongcong and Guinan Indians, to whose country they are restricted and who have thence acquired among the other natives the appellation of the Curata people The Arecuna thus becomes the medium of the barter carried on of blow-pipes on the one hand for Urari poison on the other, the latter being found in the district inhabited by the Macusi, and exchanged by them for the tube through which the arrows impregnated with it are discharged with such deadly effect It was at a settlement of Maiongcong Indians near the river Emaruni that Mr Schomburgk at last succeeded in obtaining positive information of the locality of these reeds, which he was informed were found on two lofty mountains, named by the Indians Mashiatu and Marawacca, the former of which was pointed out to him at the distance of about 20 miles The latter however lying more directly on his route was visited by him in preference , it is seated at a day's journey from a Maiongcong settlement on the banks of the Cuyaca, from whence the natives showed the beaten track After having ascended the mountain to a height of about 3500 feet above the Indian village, the traveller followed the course of a small mountain stream, on the banks of which the Curas or Curatas, as these reeds are called by the Indians, grow in dense tufts They form in general clusters of from forty to a hundred stems, which are pushed forth, as in many other *Bambuseæ*, from a

strong jointed subterranean rootstock The stem rises straight from the rhizoma, without knot or interruption, and preserving an equal thickness throughout, frequently to the height of 16 feet before the first disengagement is stretched across the interior and the first branches are given off The joints that follow succeed each other at intervals of from 15 to 18 inches, and the whole plant attains a height of from 40 to 50 feet The stem when full grown is at the base about an inch and a half in diameter or nearly 5 inches in circumference, but Mr Schomburgk mentions having seen young stems, which at the height of 20 feet, and with a thickness of scarcely a quarter of an inch offered no signs of articulation The branches are only formed when the stem begins to increase in diameter The full grown stem is of a bright green colour, perfectly smooth and hollow within The branches are verticillate generally from 3 to 4 feet in length, very slender terete and nodose, the upper joints separated by an interval of from 2 to 3 inches, and clothed by the sheaths of the leaves, which are split at the apex, persistent, striate and somewhat scabrous The leaves are linear lanceolate obliquely rounded at the base, acute of a bright green above glaucescent below, nervoso-striate, with the midrib prominent, and the margin scabrous, from 8 to 9 inches long, and 5 or 6 lines broad, they are furnished with a short petiole which is articulated to the vagina, and a series of long setæ occupy the place of the ligula The inflorescence is in terminal spikes, with a flexuose rachis the locustæ subsessile, lanceolate, lax, from $1\frac{1}{2}$ to 2 inches in length The entire plant is from 40 to 50 feet in height but the weight of its innumerable branches causes the slender stem to curve downwards so that the upper part generally describes an arch, which adds greatly to the gracefulness of its appearance Leaving out of consideration the length of the first nodeless joint it resembles in its general habit the *Bambusa latifolia* of Humboldt, which Mr Schomburgk was not unfrequently led into the mistake of confounding with it at a distance He estimates the height at which it grew as 6000 feet above the level of the sea, and its growth appears to be limited to the chain of sandstone mountains which extends between the second and fourth parallel, and forms the separation of waters between the rivers Parima Merewari, Ventuari, Orinoco and Negro The only ascertained localities were Mounts Mashiatti, Marawacca and Wanaya

Mr Schomburgk describes at length the process by which the blow-pipes are prepared, and encased, for their better security in the hollowed trunk of a slender species of palm together with the mode in which other parts of the apparatus are supplied in order to render

it available for its important uses, and the various modifications in its construction occurring among the different tribes. He adds also a particular description of the arrows and quivers in use among several of the native tribes.

To this paper was appended the following note by John Joseph Bennett, Esq. F. L. S.

‘Mr Schomburgk having placed in my hands specimens of the grass which forms the subject of his communication, with a request that (if I should find it to be unpublished) I would describe it I consulted the publications of Nees von Esenbeck and Kunth, and was at first strongly inclined to suspect that it was identical with the *Arundinaria verticillata* of those authors but a subsequent examination has satisfied me that it is a distinct species of that genus. I have had no opportunity of comparing it with specimens of *A. verticillata*, but it differs from the descriptions of that species given by the two eminent botanists above named, in the following particulars. Its leaves are linear, instead of lanceolate and smooth on both surfaces instead of scabrous the mouth of their sheaths is furnished on either side of the articulation of the leaf with a fringe of long rigid setæ, which are not mentioned as occurring in *A. verticillata*, its locustæ are sessile instead of being pedicelled and the hypogynous scales are lanceolate and acute instead of obovate and obtuse. The following character will therefore serve to distinguish the species —

Arundinaria Schomburgku

A foliis linearibus acuminatis lævibus, vaginarum ore utrinque longe setoso, spicâ simplici pauciflora, locustis sessilibus, squamulis hypogynis lanceolatis acutis

January 21 1840 —Mr Forster V. P. in the Chair

Mr Hewett Cottrell Watson, F. L. S. exhibited specimens of *Cyperum Bulbocastanum* discovered by Mr W. H. Coleman, near Cherry Hinton, Cambridgeshire and of *Seseli Libanotis* gathered by the same in a Dean west of the river Cuckmere near Seaford Sussex, being the first time it has been observed in that county.

Mr Solly, F. L. S., exhibited two splendid drawings executed by Mrs Withers of a male plant of *Encephalartos pungens* which flowered in the Royal Botanic Garden at Kew, in October last.

Mr Iliff, F. L. S., exhibited some urate of ammonia voided by the *Boa Constructor* at the Surrey Zoological Gardens, in the midst of which were several larvæ supposed by Mr Curtis to be those of the *Musca Canicularis* of Linnæus. Mr Iliff is of opinion they were voided with the excrements of the *Boa*, and referred to a case in the

Memoirs of the Medical Society of London, where he believes similar larvæ were voided from the intestines of a man

Specimens of the *Lastrea rigida* collected at Settle, Yorkshire, were presented by Mr Daniel Cooper, A L S

Read " Observations on the Ergot " By Francis Bauer Esq F R S and L S

The author as is well known has made the ergot a subject of particular study and about thirty years ago he undertook at the suggestion of Sir Joseph Banks a series of careful microscopical observations with a view to determine the nature and cause of this singular production and the beautiful drawings prepared by him at that time illustrative of the ergot in various stages of its development form part of the Banksian collections now deposited in the British Museum Mr Bauer's investigation led him to determine the ergot to be a morbid condition of the seed but he was unsuccessful in ascertaining the cause of the disease, which Messrs Smith and Quekett have satisfactorily shown to be occasioned by a minute filamentous fungus, a fact already recorded at p 1 & 4 After a long lapse of years Mr Bauer was induced to resume the subject and the result has been an additional drawing from his masterly pencil displaying the minute fungus already noticed in different stages of its growth The fungus has been named by Mr Quekett *Ergotia abortifaciens*

February 4 —Mr Forster, V P in the Chair

Read, " On the *Heliamphora nutans*, a new Pitcher Plant from British Guiana ' By George Benthara Esq F L S

The interesting subject of this communication was discovered by Mr Schomburgk growing in a marshy savannah on the mountain of Roraima on the borders of British Guiana at an elevation of about 6000 feet above the level of the sea It belongs to the *Sarraceniaceæ*, and constitutes a very distinct genus of that small but remarkable family of plants, hitherto exclusively confined to the United States The genus is principally distinguished from *Sarracenia* by the entire absence of petals small apterous stigma, and trilocular ovary

The following are the characters of this new genus

HELIAMPHORA

Perigonii foliola 4, 5, (vel 6?) hypogyna, libera, æstivatione valde imbricata, subpetaloidea *Stamina* numero indefinita, hypogynæ *Antheræ* oblongo-lineares, versatiles, biloculares, loculis oppositis longitudinaliter dehiscentibus *Ovarium* triloculare, ovulis numerosis anatropis pluri-serialiter placentæ axili affixis *Stylus* simplex, apice truncatus *Stigma* parvum, obscure trilobum, minute ciliatum " *Capsula* trilocularis, trivalvis, polysperma ' (Schomb) *Semina* obovata, compressa, testa

fusca laxiuscula, vix rugosa, in alam fusco membranaceum semen cingentem expansa Embryo parvus, teres, rectus, prope basin albuminis copiosi, radícula juxta hilum, cotyledonibus parvis

Herba perennis, uliginosa Folia radicalia, petiolus tubuloso amphoræformis, orè obliquo margine subrevoluto Scapus erectus, apice simpliciter racemosus, glaber Flores nutantes, albi v pallide rosei

1 H nutans

Read a paper, entitled "On the Structure of the Tissues of *Cycadeæ*," By D Don, Esq Libr L S, Prof Bot King's College

In *Coniferæ* the structure of the stem presents the ordinary appearance of dicotyledonous trees, the annual layers are distinctly marked, and there is a regular bipartition of each into wood and bark (liber), but in *Cycadeæ* no bipartition takes place of the fibro-vascular bundles, which in that respect resemble those of monocotyledonous plants, and the differences otherwise are very striking *Cycas* having besides a large central pith, several thick concentric alternating layers of cellular and fibro-vascular tissue, and in *Zamia* and *Encephalartos* besides the pith, there are only two very thick layers, one of fibro-vascular, and the other which is also the exterior one, of cellular tissue The great peculiarity of the *Coniferæ*, and which distinguishes them as well from *Cycadeæ* as from every other family is the remarkable uniformity of their woody tissue, which consists of slender tubes furnished on the sides parallel to the medullary rays with one or more rows of circular or angular dots, but in *Cycadeæ* no such uniformity is observable, their tissue, as in other phænogamous plants, consisting of two kinds of vessels, namely of slender transparent tubes without dots or markings, and of dotted reticulated and spiral vessels, which are capable of being unrolled The former are identical with the fibrous or woody tissue, whilst the latter, which form a part of each bundle, can only be compared to the strictly vascular tissue of other plants These dotted vessels in *Cycadeæ* bear a considerable resemblance to the vessels of *Coniferæ*, and especially to those of *Dammara* and *Araucaria*, from the dots being disposed in rows, and confined to the two vertical sides of the vessel only, and they are moreover alternate, as in the two genera just mentioned In *Cycadeæ*, however, the dots present much less regularity in number and size than in *Coniferæ*, not only in different vessels of the same bundle but in different parts of the same vessel, forming one, two, three, four, and five rows, and they are not always confined to the vertical sides, but appear in some cases to follow the entire circle of the vessel Their form is oblong, or elliptical, in *Cycas revoluta*, *circinalis*, *glauca*, and *speciosa*, *Zamia furfuracea* and *pumila* as well as in *Encephalartos horridus* and *spiralis*, but they are sometimes longer, narrower and nearly linear, giving the vessel

the appearance of being marked with transverse stripes. The vessels in all present so much similarity, that no generic distinction can be drawn from them. The dots are always arranged diagonally. The dotted vessels of *Zamia furfuracea* and *pumila* were observed to unroll spirally in the form of a band presenting a striking resemblance to those of Ferns. The band was found to vary in breadth in different vessels and was furnished with transverse rows, composed of two, three, or more dots. The coils followed the direction of the dots and the unrolling was from right to left. In *Cycas revoluta* dotted vessels frequently occur with a single row of dots, but from the circumstance of the dots on both sides being in view at the same time they are liable to be mistaken as having a double row on each side. Besides the dotted vessels there occurs throughout *Cycadeæ* another variety, differing but little from the ordinary spiral vessel except in the tendency of the coils to unite. In some vessels the coils are free and the fibre exhibits frequently at intervals, bifurcations or narrow loops, in others the coils unite at one or both sides in which case the vessel presents a series either of rings or bars. The fibre then is with difficulty unrolled, and it often breaks off into rings, or the bars separate at the point where the coils unite, which is generally on the perpendicular sides of the vessel. In other cases the vessels are distinctly reticulated, and they then exhibit a striking analogy to the dotted cellules in *Cycas revoluta*. All these modifications are frequently to be observed in the same vessel in *Zamia furfuracea* and *pumila* a fact which affords conclusive evidence of the accuracy of the theory advanced by Meyen which refers the spiral, annular, reticulated, and dotted vessels to a common type. The dots and stripes are evidently the thinnest portions of the tube being most probably parts of the primitive membrane remaining uncovered by the matter subsequently deposited on the walls.

The cellular tissue of *Cycadeæ* consists of tolerably regular parenchyma, composed of prismatic, six-sided cellules. In the species of *Zamia* and *Encephalartos* so often referred to, the walls of the cellules appear to be of a uniform thickness and transparency, and destitute both of dots or markings but in the adult fronds of *Cycas revoluta* a different structure presents itself, for the walls of the cellules are furnished with numerous elliptical, obliquely transverse dots or spaces, where the membrane is so exceedingly delicate and transparent as to give to the cellules the appearance of being perforated by holes, the intervening spaces being covered by incrustating matter, disposed in the form of confluent bands, which when viewed under the microscope, resemble a kind of network. The

dots or spaces uncovered by incrustating matter, are generally of a large size, and occur more particularly on the vertical sides of the cellules a band usually running along the middle of the two opposite sides. The bands vary in breadth, as do the dots and they not unfrequently exhibit minute transparent points or spaces where the solid matter forming the band shows a tendency to separate. The extreme delicacy and transparency of the dots or spaces of whatever size, appear fully to prove that they are parts of the primitive membrane of the cellule which are uncovered by the incrustating matter. A solution of iodine will be found of great service in determining the actual existence of the membrane at those parts for although it does not materially alter its colour it tends very much to diminish its transparency and renders it distinctly visible, so as to leave no doubt that the spaces are not openings. The bands are evidently the result of a partial lignification, and indeed no better example can be offered than *Cycas revoluta* to illustrate and confirm the correctness of the views advanced by Schleiden as to the origin of the bands and fibres in the cellules and vessels of plants. Being anxious to ascertain whether the bands exist in an early period the author had recourse to the examination of a young undeveloped frond about two weeks old and he was much gratified by finding his previous suspicions fully confirmed the cellules then being of a uniform transparency presenting neither bands nor dots, but furnished with a distinct cyto-blast or nucleus, which was found to have entirely disappeared from those cellules in which the incrustating matter was visible proving that the incrustating matter is formed at the expense of the nucleus. The matter forming the bands is continuous and is evidently not formed by a coalescing of spiral fibres, as some might suppose for it is perfectly solid, and shows no disposition to unroll or to break up into fibres. The bands most probably originated from the shrinking up of the incrustating substance, which at first was equally diffused in a fluid state over the walls, and which from the mere effects of consolidation, aided by the distention, and perhaps enlargement of the cellule, would naturally leave portions of the primitive membrane uncovered. That the dotted and reticulated vessels in *Cycadeæ* are of the same nature and originate in a similar way as the cellules just described there seems no reasonable ground to doubt. The parenchymatous cellules in *Cycas circinalis glauca*, and *speciosa* resemble those of *Zamia* and *Encephalartos* in having their walls of a nearly uniform thickness and transparency, being but rarely furnished with a few elliptical obliquely transverse spaces

or dots • The cellules in *Cycas revoluta* vary both in size and structure, some being three or four times longer, whilst others are still longer and narrower and furnished with more numerous and much smaller dots which are not confined to the sides, but are disposed around the tube These last, which have been observed also in *Cycas glauca* and *circinalis*, present an evident transition to the dotted vessels

The whole of the *Cycadeæ* are supplied with numerous gummiferous canals, often of great length, and uniformly furnished with distinct cellular walls of considerable thickness, and which have been accurately described and figured by Professor Morien in a recent memoir •

Notwithstanding the analogies presented by their reproductive organs the author considers the *Cycadeæ* is related to *Conifera* only in a remote degree, and that they constitute the remains of a class of plants which belonged to a former vegetation

ZOOLOGICAL SOCIETY

June 25 1839 —Dr Bostock in the Chair

A paper by T C Eyton, Esq entitled "Catalogue of a Collection of Birds from Malaya, with descriptions of the new species," was read

'The collection of Birds, of which the following is a catalogue are in the possession of Mr Evans of the Wyle Cop Shrewsbury having been collected by his brother in the above mentioned country This collection is particularly interesting when taken in conjunction with that of the neighbouring islands of Sumatra and Java an account of which is published in the Transactions of the Linnæan Society vol xiii, by Sir T Stamford Raffles and Dr Horsfield

"The zoology of Malaya is altogether highly deserving of the attention of the naturalist presenting as it does a connecting link between those families of which Australia is the metropolis, and the forms of the Old World The ornithology of Australia is distinguished by the number of species belonging to the family *Meliphagidæ* which it produces, and we find from the present catalogue and that above-mentioned, that the Indian islands and the Malay peninsula also possess a greater number of species belonging to this family than any other portion of the world excepting Australia This transition may also be traced through the marsupial animals and man, the Malay variety of the human species approaching nearer to the Australian than any other in the form of the cranium •

'The present collection contains eighty-nine species, of which several are new to science, there are also some entirely new genera

it is singularly deficient in Raptorial and Natatorial birds 'not possessing one of either order, but this perhaps may be owing to the collection having been made chiefly in the interior

Podargus Javanicus Horsf Native name *Burong Saian*

Harpactes Dulauceli Gould Native name *Burong Mass*

Harpactes Diada, Gould Native name same as preceding

Eurystomus cyanocollis Vieill Native name *Tihong Lampay*

The collection contains both male and female, the latter is merely distinguished from the former by its more obscure colouring

Eurylaumus Corydon, Temm

Cymbyrhynchus cucullatus *Eurylaumus cucullatus* Temm

Native name *Tamplana Lalin*

Cymbyrhynchus nasutus Vig Native name *Burong Ujuu*

Halcyon Capensis Sw Native name *Burong Kaha*

HALCYON VARIA *H pectore gula, ventre strigisque oculos cingente ferrugineis, capite nucha et striga a mandibula inferiore ad capistrum brunneis, singulis pennis tenuis caeruleis ornatis primarius dorso scapularibusque brunneis his externe flavo marginatis illis maculatis, rostro flavo culmine obscuro*

Long tot $8\frac{1}{4}$ unc rostri $1\frac{1}{4}$ unc tarsi $1\frac{1}{10}$

Native name *Kaing Kaing*

Halcyon pulchella *Dacelo pulchella* Horsf

Native name, *Kaing Kaing Kimba*

Alcedo Smyrncensis Lath See *Kaing Kaing*

Alcedo caerulea Linn Native name *Raja Ulang*

Nyctiornis amictus Sw *Merops amictus* Temm

Native name, *Kay Chua*

Merops Javanicus Horsf Native name *Beiray Berray*

Cinnyris Javanicus, Steph Native name, *Chichap*

Cinnyris affinis Horsf Native name *Major*

Calypomena viridis, Raff Native name, *Siebo*

Chloropsis Malabaricus, Jard and Selby Native name, *Burong daou*

The female differs from the male in having the markings less distinct

Chloropsis Sonnerati Jard and Selby Native name *Mubadaon*

The female and young are destitute of the black throat, a straw coloured mark being sometimes substituted for it

Irena puella Horsf Native name *Krouing*

Muscipeta paradisia Le Vaill Native name, *Mura jabone*

MUSCIPETA ATROCALDAIA *Mus toto corpore purpureo atio, sed pectore imo abdomineque albis*

Long tot 9 unc rostri $\frac{1}{2}$ unc tarsi, $\frac{2}{7}$ unc

Native name, *Murra jabone*

Genus MICROTARSUS n g

Rostrum ferè capiti æquale altius quàm latum ad apicem incisum
ultraque nares compressum, ad basim setis armatum, *nares* mem-
branaceæ, parvæ rotundatæ

Tarsi brevissimi superiore parte plumati, *digiti* debiles, externi vix
longiores quam interni posteriores medios æquantes *ungues* com-
pressi posteriores longissimi *scuta* tarsi indivisa

Ala mediocres rotundatæ primæ pennarum spuria secunda brevior
tertia, tertia duabusque proximis inter se æqualibus

Cauda rotundatæ tectricibus superioribus mollibus et longis

Obs The above genus is closely allied to *Micropus* of Swainson •

MICROTARSIS MELANOTRICHOS *Mur ater tectricibus primariis*
apicibus albis, rostro pedibusque atris

Long tot 6½ unc *rostri* 1 unc *tarsi* 6½ unc

Native name, *Muba tando*

Genus MALACOPTERON n g

Rostrum ferè capiti æquale altius quam latum ad apicem incisum
ultraque nares compressum ad basim setis armatum, mandibula
inferiore ad basim tumida

Tarsi mediocres *digiti* externi vix longiores quam interni, poste-
riores medios æquantes, *ungues* compressi posteriores longissimi
scuta tarsi vix divisa

Alæ breves rotundatæ, pennæ secundariæ primariis ferè equantibus
prima pennarum spuria secunda brevior tertia quæ longissima
est

Cauda paucarum pennarum composita rotundata tectricibus supe-
rioribus mollibus et longis

Obs This genus is allied to *Microtarsus* in some particulars and
to *Brachypus* in others it agrees with both in the soft and downy
nature of the tail coverts

MALACOPTERON MAGNUM *Mal fronte caudique ferrugineis nucha*
atro dorso strigisque transversis pectore cinereis, alis brunneis
rostro flavo

Long tot, 6 unc *rostri* 7½ unc *tarsi* 7½ unc

Fem marc minor capite nuchaque ferrugineo et atro maculatis

Native name, *Burong Map*

MALACOPTERON CINEREUS *Mal femina speciei præcedentis similis*
sed magnitudine multum inferior

Long tot 5½ unc *rostri* 5 lin, *tarsi* 8 lin •

Brachypus entylotus Jard and Selb Native name, *Mirfa*

BRACHYPTERYX NIGROCAPitata *Bra vertice atro genis cinereis,*
gula alba, dorso caudique brunneis pectore abdomineque ferru-
gineis hoc obscurissimo, rostri mandibula superiore fuliginosa, in-
feriore flava tarsis pedibusque brunneis

Long tot 6½ unc *rostri*, ½ unc *tarsi*, 1½ unc

Dicranus Malabaricus Steph Native name *Chanee* •

Obs *Dic aratus* of Stephens is the female of this species

Lanius virgatus Temm Native name, *Burong Tana*

LANIUS STRIGATUS *Lan* dorso, caudâ alisque ferrugineis, illo atro strigato paucis pennis tertiarum et flexuræ alarum lined atris, capite cinereo, sparso et strigato atro, corpore subtus obscure albo, lateribus pectorique parce atro strigatis, rostris apice atro, basi albid, tarsi pedibusque brunneis

Long tot $6\frac{1}{2}$ unc, rostri, $\frac{7}{8}$ unc, tarsi, $1\frac{1}{8}$ unc

Obs This is probably a young bird

Lamprotornis chalybeus *Turdus chalybeus*, Horsf

Native name *Terling*

Turdus Mindanensis, Gmel Native name, *Murray*

Kittacincta macrourus, Gould *Turdus macrourus* Gmel

Native name, *Mua buta*

TURDIS MODESTUS *Tur* dorso, tectricibus alarum verticisque olivaceo-brunneis, paucis tectricum primum prapilatis albo, primarius caudaque brunneis, gula, strigâ oculari abdomineque albis, illâ maculis cinereis sparsâ, lateribus capitis et pectore inferiore cinereis, lateribus pectorique superiore ferrugineis, mandibulâ superiore pedibusque brunneis, inferiore flavâ

Long tot $8\frac{3}{4}$ unc, rostri $\frac{7}{8}$ unc, tarsi, $1\frac{1}{8}$ unc

Native name *Kwaran*

PASTOR MALAYENSIS *P* dorso, cauda alisque viridi æneis, tectricibus tertiarum abdomineque albis, vertice nuchaque pennis elongatis, cinereis, paucis pennis viridi circumclusis, mento albo, corpore subtus cinereo

Long tot $6\frac{3}{4}$ unc, rostri $\frac{1}{2}$ unc, tarsi 1 unc

Fem dorso brunneo, reliquis coloribus obscuris

Native name, *Brass Brass*

Iora scapularis Horsf Native name, *Duong Capas*

Genus CRATAIONYX n g

Rostrum forte, mandibulâ superiore arcuatâ, mediocri, nares rotundatæ, basales, setis brevibus tectæ

Pedes validi syndactyli digitis medio posteriori inter se æquantibus, exterioribus interioribus vix longioribus

Tarsi validi elongati ungues validi, posteriores maximi

Alæ remigibus primariis spuris secundis vix brevioribus tertis, 4^{tis}, 5^{tis}, 6^{tis}que inter se æqualibus

Cauda longa rotundata

CRATAIONYX FLAVA *Crat* ater vertice cristato, abdomine pectorique inferiore flavis, tarsi pedibusque flavis

Long tot 7 unc, rostri, $\frac{1}{2}$ unc, tarsi, $1\frac{1}{8}$ unc

Native name, *Seray Seray*

CRATAIONYX ATER *Crat* ænea, vertice cristato, abdomine pectorique inferiore, flavis, tarsi pedibusque flavis

Long tot 7 unc, rostri, $\frac{1}{2}$ unc, tarsi, $1\frac{1}{8}$ unc

Oriolus xanthonotus, Horsf Native name *Simpelong Rait*

Oriolus Sinensis, Linn Native name, *Kapinday*

Gracula religiosa, Auct Native name, *Tchong*

Platylophus galericulatus, Temm Native name, *see Jerray*

Putta brachyura, Auct Native name *Mortua Plando*

PITTA COCCINEA *P* occipite nuchâ corporeque subtus coccineis, alis dorso, caudâ strigâque utrinque nuchæ cyaneis, gutture ferrugineis, lateribus capitis, pedibus, rostroque atris

Long corp 8 unc rostrum, $\frac{3}{4}$ unc, tarsi, $1\frac{1}{2}$ unc

Native name same as the last

BUCFROS BICOLOR *Buc ater*, tectricibus tectus lateralibus caudæque apicibus albis, rostro albo strigâ cingente basim atrâ, casside mediocrî carinatâ a dimidio capitis ad bis trientis rostri tendente

Long corp $3\frac{1}{2}$ unc rostri, 6 unc calina cassidis 5 unc tarsi $2\frac{1}{2}$ unc

Jun casside non perfecta et atrâ Native name, *Kay Kay*

Euplectes Philippinensis *Loria Philippinensis*, Linn

Native name *Tampua*

ANTHUS MALAYENSIS *An* dorso brunneo, marginibus pennarum saturatioribus, corpore subtus ferrugineo leviter tincto duabus tectricibus anterioribus caudæ albis, pectore maculis brunneis adperso, primis marginibus anterioribus flavis

Long tot $6\frac{1}{4}$ unc, rostri $\frac{1}{2}$ unc, tarsi, $1\frac{1}{8}$ unc, ung post $\frac{1}{2}$ unc Native name, *Langhar*

The present species which is the *An pratensis* of Raffles and of which the collection possesses two specimens is nearly allied to *Anthus trivialis* but differs in being of a larger size

Dicaeum cantillans Ste

Dicaeum saccharina *Certhia saccharina* Lath Nat name, *Nella*

Dicaeum cruentata Horsf

DICAUM ICNICAPITIA *Dic* dorso, cauda, tectricibus alarum, primis externis partibus, lateribusque capitis obscure azureis, striga oculari atrâ, gula corporeque subtus aurantiacis, macula pectorali verticisque rubris

Long tot $3\frac{1}{2}$ unc rostri, $\frac{3}{4}$ unc, tarsi, $\frac{1}{2}$ unc

Native name *Nalloo*

Fem supernè cinerea subtusque flava irregulariter cinereo maculata, rubro cristata

ANTHREPIES IJAVICASTLR *An* capite, dorso, pectori colloque cinereo-rufidibus, corpore subtus flavo, alis cauda tectricibusque alarum brunneis, rostri mandibula superiore atrâ, inferiore flava, pedibus brunneis,

Long tot 8 unc, rostri $1\frac{5}{8}$ unc, tarsi $1\frac{1}{2}$ unc

Native name *Chichap Rumba*

ANTHRITES MODESTA *An* vertice, dorso alis, caudæque viridi-olivaceis hac singulis pennis mediis brunneis, illa præpilatâ atrâ, corpore subtus viridi, singulis pennis in mediis obscuris, rostro pedibusque brunneis

Long tot $6\frac{1}{2}$ unc rostri $1\frac{1}{4}$ unc, tarsi $\frac{5}{8}$ unc

Native name, *Chichap Nio*

Phœnicophaus tricolor, Steph Native name *Kado besar*

Phœnicophaus chlorocephalus *Cuculus chlorocephalus*, Raffles

Native name, see *Lahia*

Phœnicophaus Crawfordii Gray Native name *Kada Kachie*

Phœnicophaus Javarius Horsf Native name *Kada Apie*

PHŒNICOPHAUS VIRIDIROSTRIS *Phœn alis dorso caudaque castaneis, primariis apicibus brunneis, rectricibus caudæ apicibus albis, pone striga atra ornatis, capite, collo, pectoreque superiore cinereis, corpore subtus ferrugineo*

Long tot 13 unc rostri 1 unc tarsi 1 unc

Native name, see *Lahia*

Psittacula Malaccensis Kuhl Native name, *Tana*

Bucco trimaculata, Gray Native name, *Tanda*

Bucco versicolor, Raff Native name, *Tahoor*

BUCCO QUADRICOLOR *Buc viridis, primarius brunneis, rectricibus caudæ inferioribus partibus azureis, fronte aureo, macula coccinea posteriore utrinque ad latus locata, strigâ peroculari atra, hac antice macula coccinea, infra azurea ornata, gula coccinea, pectore superiore cæruleo maculis coccineis ornato macula flava ad angulum inferius rostri, rostro, tarsi, pedibusque atris*

Long tot $8\frac{1}{2}$ unc, rostri, $1\frac{1}{2}$ unc tarsi $1\frac{1}{8}$ unc

Native name, *Tahoor Capata Cuning*

Genus MEGALORHYNCHUS n g

Rostrum validum culminatum carina basali vix ad apicem aduncâ, altius quàm latum *nares* magnæ basales, rotundatæ setis tectæ

Pedes scissorii digiti bini locati exteriores singulis partibus æquales et longiores quàm interiores posteriores et exteriores brevissimi

Alæ primis pennarum spuris, secundis brevibus tertius 4^{ta}, 5^{ta}, 6^{ta}, inter se æqualibus

Tarsi mediocres

Cauda rotundatâ mediocris

MEGALORHYNCHUS SPINOSUS *Meg superioribus partibus brunneis, pennis præpilatis olæ colore, vertice pennis medius spinosis, oculis spatulis nudis et rubris circumdati, gula obscure ferruginea, corpore subtus sordide albo*

Long tot $6\frac{1}{2}$ unc, rostri, $1\frac{1}{2}$, tarsi, $1\frac{8}{12}$ unc

Native name, *Ariko Berine*

Chrysonotus Tiga *Picus Tiga* Horsf

Native name *Glato*

Chrysonotus miniatus *Picus miniatus*, Gmel

Native name, *Glato*

Picus validus Temm Native name *Glato*

Hemicircus badius, *Picus badius* Raff

HEMICIRCUS BRUNNEUS *Hem brunneus transversim ferrugineo*

strigatus, gula strigis minutis, vertice genisque brunneis et non strigatis, macula oblongâ ad latera cervicis flavo-ferruginea, nota ab unguulo inferiore rostri utrinque ad gulam tendente coccinea

Long tot $7\frac{3}{4}$ unc rostri 1 unc tarsi $\frac{3}{4}$ unc

Hemicircus tristis Picus tristis Horsf

Picus pouilolophus Temm Native name, *Glato*

Polyplectron Chinquis Temm

Nycthemerus erythrophthalmus Phasianus erythrophthalmus, Raffles Native name *Pagas*

Cryptonyx coronatus, Temm Native name, *Bestum*

PERDIX ARUCINOSUS *Perd aruginosus*, tertiarus transversim strigatis atro, abdomine gulaque saturatioribus, nullo calcare, rostris tarsiisque atris, illo forti

Long tot 10 unc rostri $\frac{5}{8}$ unc tarsi, $1\frac{1}{4}$ unc

Native name see *Hole*

Hemipodius Taigour, Sykes Native name *Pochio*

HEMIPODIUS ATROGUIARIS *Hem gula pectoreque superiore atris, pennis ad latera colli albis atro præpilatis, illis verticis et frontis atris, albo præpilatis, dorso brunneo, singulis pennis transversim strigatis atro, et maculis parvis albis sparsis, tectricibus atris præpilatis, et transversim late strigatis flavo ferrugineo, tectricibus cauda ferrugineis, et super caudam tendentibus, latibus atris, rostris aurantiaco pedibus, tarsisque brunneis*

Long tot $6\frac{1}{2}$ unc rostri 7 lin tarsi, 1 unc

Native name *Pochio*

Coturnix Sinensis, Temm Native name *Pechan*

Columba Javanica Gmel Native name *Paonay Crochi*

Columba jambu Gmel Native name *Paonay Gadang*

Vinago vernans *Columba vernans*, Linn

Native name, *Paonay Crochi*

Vinago Olax *Columba Olax* Temm

Native name *Semboan*

Rallus gularis Horsf Native name *Rentar*

Gallinula phanicura, Lath Native name *Roa Roa*

Porphyrio Indicus, Horsf Native name *Burong Tedon*

Charadrius Viginianus Bostik Native name *Kangbang Saut*

Totanus Damarensis Horsf Native name, *Kadidie*

Scotopax heterura, Hodgs Native name, *Reshail*

Mr Waterhouse read a paper on a new species of Rodent which had been sent from the island of Luzon one of the Philippines by Hugh Cuming Esq, Corresponding Member

In general appearance this Rodent might be mistaken for a species of *Capromys*, in size it is about equal to the *C. Fournieri* the gene

and characters of the skull and dentition, however, indicate that its affinity is with the *Muridæ*

The skull, compared with that of the common Rat, differs in being of a more ovate form, the occipital portion being somewhat elongated and considerably contracted, the width between the orbits is comparatively great and behind the orbits the frontal bones are expanded, and join with the temporal to form a distinct post-orbital process. The interparietal bone instead of being transverse, is almost circular. The auditory bullæ are very small. The interdental portion of the palate is slightly contracted in front so that the molares diverge posteriorly, the ramus of the lower jaw are less deeply emarginated behind the coronoid portion is smaller and the descending ramus is broader and rounded, the symphysis menti is of considerable extent. The incisor teeth are less compressed and less deep from front to back. The molar teeth are of a more simple structure, the anterior molar of the upper jaw consists of three transverse lobes, and the second and third consist each of two transverse lobes. In the lower jaw the anterior molar consists of four lobes a small rounded lobe in front followed by two transverse lobes, of which the anterior one is the smaller and finally a small transverse posterior lobe, the second molar consists of two equal transverse lobes and a small lobe behind them, the last molar consists of two simple transverse lobes."

On account of the differences observable in the structure of the teeth and form of the skull combined with the hairy nature of the tail and ears, Mr Waterhouse regarded this animal as constituting a sub genus and proposed for it the name of *Phloeomys*, this name being suggested by the habit of the animal, which Mr Cuming (after whom the species is named) states, feeds chiefly on the bark of trees. It may be thus characterized

MUS (PHLOEOMYS) CUMINGI *M vellere setoso, suberecto, pilis lanuginosis intermixtis, auribus mediocribus extus pilis longis obsitis, mystacibus crebris et perlongis, pedibus permagnis et latis subtus nudis, cauda mediocri, pilis rigidis et longis (ad Muræm Rattum rationi habita) crebre obsita colore nigrescenti-fusco sordide flavo lavato, subtus pallidior, cauda nigrescente, pilis longioribus in capite et dorso nigris*

	unc	lin
Longitudo capitis corporisque	19	0
———— caudæ	13	0
———— antepedis (unguibus exclusis)	1	8½
———— tarsi	2	10
———— auris	1	0
———— cranii ossis	2	4
Latitudo ejusdem	1	8½

Hab apud insulam Luzon

July 9, 1839 —The Rev J Barlow in the Chair

A letter addressed to Col Sykes by Sir John McNeill was read It related to a Dog recently presented by that gentleman to the Society This kind of dog Sir John McNeill states is used by the wandering tribes in Persia to guard their flocks it is a shaggy animal, nearly as large as a Newfoundland and very fierce and powerful The dam of the animal at the menagerie killed a full grown wolf without assistance

A letter from Augustus Elliott Fuller, Esq, was read In this letter, which is addressed to the Secretary and is dated June 29 1839 Mr Fuller encloses an account from his head keeper, Henry Cheal respecting two broods of Woodcocks (*Scolopax rusticola*) which were bred in the woods of Mr Fuller's estate at Rose Hill in Sussex

The two broods referred to consisted each of four birds and when first observed about the second week in April they could but just run as they grew very fast however they were soon able to fly Mr Fuller's keeper believes the young woodcock is able to run as soon as hatched, and states that according to his own observation and the report of others they always build in a small hole which they make on the plain ground they select a dry situation for the nest but this is placed near a moist soil to which the old birds lead their young to procure food

Mr Waterhouse pointed out the distinguishing characters of a new species of Loucan, which had been forwarded to the Society by the President the Earl of Derby, for exhibition and description

This species of Loucan approaches most nearly in size and colouring to the *Pteroglossus hypoglaucus* of Mr Gould's Monograph but the beak, which is totally black is much smaller and less arched, the nostrils do not extend so far forwards, and are hidden by the feathers of the head and there is no longitudinal groove in front of them, as in the species above named, and others of the genus the blue of the under parts of the body is of a much paler and purer tint and the feathers on these parts are white at the base It differs moreover, in having the throat and checks white, and the upper tail coverts black

A totally black beak being an uncommon character in the species belonging to the subgenus *Pteroglossus*, Mr Waterhouse proposed for this new species the name *nigrirostris*, and proceeded to characterize it as follows

PTEROGLOSSUS NIGRIROSTRIS *Pt rostris, capite summo nuchâque nigris, gula alba, corpore supra olivaceo fusco, rectricibus secundariis olivaceo-viridibus, uropygio pallide sulphureo caudâ,*

tectricibus caudæ, nigrescenti viridibus, plumis quatuor intermediis ad apicem femoribusque castaneis corpore subtus pallide cyaneo, crisso coccineo pedibus nigris

Long tot 20 unc , rostri $3\frac{1}{2}$ alæ, $6\frac{3}{4}$, caudæ, 7 tarsi $1\frac{1}{2}$

Hab — ?

Mr Fraser read his descriptions of two new species of Birds from a collection made in the Island of Luzon and recently forwarded to the Society by Hugh Cuming Esq Corresponding Member The first of these belongs to the family *Cuculidæ* the genus *Phænicophaus* and to Mr Swunson's subdivision of that genus to which he has applied the name *Dasylophus* It may at once be distinguished from all the known members of the family by the singular structure of the feathers of its crest and throat the shafts of these feathers are expanded at their extremities into laminæ which may be compared to the shavings of whalebone, and in this respect they resemble the feathers of the crest of the Toucan to which Mr Gould in his Monograph applies the name *Pteroglossus ulocomus* which is the *Pt Beauharnesi* of Wagler* but are not curled as in that species

The feathers above the nostrils of the crest and chin and along the middle of the throat are grey at the base have a decided white spot towards the middle and are terminated by a broad expansion of the shaft which is of a glossy black colour and exhibits blue or greenish reflections The external edge of this expanded portion of the shaft is minutely pectinated The occiput and sides of the head are grey passing into dirty white on the cheeks and sides of the throat the hinder part and sides of the neck, and the breast, are of a deep chestnut colour the back, wings, and tail are of a deep shining green colour, all the tail feathers are broadly tipped with white the vent thighs and under tail-coverts are dusky brown, tinged with green the bill is horn colour, and the feet are olive

This beautiful and interesting species Mr Fraser proposed to name after its discoverer Mr Cuming Its principal distinguishing characters may be thus expressed

PHÆNICOPHAUS CUMINGI Ph cristatus, plumis cristæ et gutturis laminis corneis ovalibus splendide nigris terminatis, nuchâ, et pectore castaneis, facie pallide cinerea, alis et caudâ metallice virescentibus hinc ad apicem albâ

Long tot 16 unc rostri, $1\frac{1}{2}$, alæ, 6, caudæ 8, tarsi $1\frac{1}{4}$

To the bird above described the following memorandum was attached — '*Ansis En Bicol*, language of Albay Eyes red pupil

* Oken's Isis for 1832, part iii p 279, also in the 'Ausland,' 1830, No 118, p 470

large and black length from beak to tail $8\frac{1}{2}$ inches around the body 5 inches Signed H. Cumming

The second bird characterized by Mr. Fraser is a new species of Duck (*Anas*) which is nearly allied to the *Anas superciliosa* Gmel., but differs in being of a smaller size in having the whole of the plumage much lighter in colour, and in the sides of the head and neck being rufous instead of pale buff it moreover has but one dark stripe on the side of the head whereas *Anas superciliosa* has two

The middle of the forehead crown of the head, and a line down the back of the neck are dark brown from the bill to the eye and thence to the occiput is a brown line, which is separated from the crown of the head by a broad stripe, which is of a pale rufous tint the cheeks sides of the neck chin and upper part of the throat are of the same colour the whole of the body is brown becoming gradually darker on the rump and tail feathers all the feathers on the upper parts are edged with pale rufous the wing coverts are crossed by a narrow white band near their extremity and terminate in a deep velvet-like black colour, the *speculum* is deep glossy green, with purple reflections and bounded behind by velvety black to this succeeds a narrow white line the bill and feet are apparently dark olive

To this species Mr. Fraser applies the name *Luzonica* it may be thus characterized

ANAS LUZONICA *An. superciliosae fusca vertice nigrescenti fusco striga superoculari genis et gutture pallide castaneis, speculo alarum purpureo virescente antice et postice nigro marginato, corpore subtilius fusciscenti-cinereo*

Long tot 21 unc. rostri, $2\frac{1}{4}$ ala, $8\frac{3}{4}$ cauda $4\frac{1}{2}$ tarsi $1\frac{1}{2}$

A collection of Birds from South Australia was exhibited This collection recently presented to the Society by the South Australian Company contains the following species —

Falco melanogenys, Gould Native name, *Monkah*

Falco Berigora Vig et Horsf Native name *Car-cown, ya*

Falco Cenchroides *Cenchrus Cenchroides*, Gould Native name *Monne monne* Golden Hawk

Athene fortis Gould Native name *Ounda-y papa*

Egotheles lunulata Jard et Selb Native name *Na nie*, Night Hawk or Eve jar of the colonists

Dacelo gigantea Leach Native name *Cracow-Kata* Laughing-Jackass of the colonists

Graucalus melanops, Vig et Horsf Native name *Oia*

Cisticus hypoleucus, Gould Native name, *Corow-Raw*, Whistling Magpie of the colonists

Platycercus Pennantii, Vig Native name, *Na-hall-ya* Rosetta Parrot of the colonists

- Nanodes undulatus* Vig et Horsf Native name, *Tu cou ce*
 Scalp Parrot of the colonists
Trichoglossus concinnus Vig et Horsf
Trichoglossus purpureus Native name *Warrow Ka*
Meliphaga Novæ-Hollandiæ, Vig et Horsf Native name *Wadow*
Anthochaera rufogularis *Acanthegonys rufogularis*, Gould
Sitella melanoccephala Gould Native name, *Coolta tucow*
Coturnix Australis Temm Native name *Iou ta-wa-tee*
Coturnix pectoralis Gould Native name *Iou ta wa tee* This
 is no doubt the male of the preceding species
Charadrius nigrifrons *Ægialitis nigrifrons* Gould
Rallus Philippinensis Less Native name *Eerncou* Land Rail
 of the colonists
Porphyrio melanotus Temm Native name, *Cou oue* Bald Coot
 of the colonists
Nycticorax Caldonicus, Less
Anas superciliosa, Gmel Native name *Tow-an da*²
Rhynchaspis Rhyncotis Steph
Cygnus atratus Shaw
Phalacrocorax Carboideus, Gould Native name *Yal tow* Black
 Shag of the colonists

Mr Fraser who brought these birds severally under the notice of the meeting and who at the same time furnished the above list observed that the chief interest attached to this collection consisted in the locality in which it was formed as naturalists were no doubt anxious to learn the geographical ranges of the Australian birds

July 23, 1839 —William Yarrell, Esq, Vice-President in the Chair

A collection of 68 Bird-skins made by Capt Belcher on the west coast of South America, and presented to the Society by the Lords Commissioners of the Admiralty, was exhibited, and commented on by Mr Vigors

Among other observations, Mr Vigors directed the attention of the Society to typical or leading characters, of the various groups of which specimens were found in the collection and pointed out the relations which subsist between the great primary groups of his own system of ornithology, and the different situations they are fitted to occupy,—the earth, the water, the air, the forests, and the marshes Mr Vigors afterwards went over the collection in detail, and made many interesting observations respecting the habits and relations of the different species

Mr Ogilby called attention to a new species of Squirrel sent from the west coast of South America by Capt Belcher, at the same time as the bird skins noticed by Mr Vigors This species more nearly resembles the Coquallin of Buffon (*S variegatus*, Gmel) than any

other with which I am acquainted. It is, however, much smaller, rather less indeed than the common European Squirrel and differs both in the colours themselves and in their distribution. The whole upper surface of the head and nape as well as the cheeks of the Coquallin, are intense and uniform black, the ears and muzzle are pure white, the black and light yellowish brown colours of the back are finely intermixed, or as it were granulated whilst the long hairs of the tail are yellowish red at the roots, glossy black in the middle and intense red on the terminal portion. In the new species on the contrary the head muzzle cheeks, and neck, are of the same colour as the back the ears are but thinly covered with short hair, and that of a sandy red colour surrounded by a narrow black border, most conspicuous in front the back colours are brindled, or mixed in wavy irregular patches, and the long hairs of the tail are mostly black terminated by snowy white tips which give the whole organ a hoary appearance, many of these hairs, however, have yellowish gray roots. The limbs and under-surface of the body in both species are red, but in the present species it is of a lighter and more yellowish cast.

For this species Mr. Ogilby proposed the name *variegatoides* its chief characters are as follow

SCIURUS VARIIGATOIDIS *Sc. supra fulvo nigroque variegatus, subtus helvolus, caudæ longa cylindrica floccosa canescente, auriculis imberbibus sibilufis nigro marginatis*

	unc	lin
Longitudo ab apice rostri ad caudæ basin	10	0
caudæ	11	0
tarsi digitorumque	2	6
auris	0	9
ab apice rostri ad basin auris	2	1½

A new species of Squirrel sent by Hugh Cuming, Esq. Corresponding Member from one of the Philippine Islands, was thus characterized by Mr. Waterhouse

SCIURUS PHILIPPINENSIS *Sc. supra intense fuscus pilis nigri-rufescenti flavo annulatis subtus cinerescens albus capite et anticis pedibus cinerescens, auribus parvulis, caudæ mediocris*

	unc	lin
Longitudo ab apice rostri ad caudæ basin	6	6
caudæ	6	3
ab apice rostri ad basin auris	1	6
tarsi digitorumque	1	9
auris	0	3½

Hab Mindanado

This species is rather larger than *Sc. Palmarum* and less than *Sc. brevittatus*. The general hue of the upper parts, sides of the

body and outer side of the hinder legs is deep brown (a much richer and deeper colour than the same parts in *Sc. bivittatus*) this tint is produced by the admixture of rust colour and black, the hairs being of the latter colour, and rather broadly annulated with rusty-red near the apex. The tail is not very bushy, the hairs are black with two bright rusty bars. The under parts of the body are grayish white, with a faint yellow tint. The head and fore legs are grayish, and the feet are black, slightly grizzled with rust colour."

Mr Waterhouse then proceeded to point out certain differences observable in the skulls of two species of Squirrels which are usually confounded under the name *Sciurus Palmarum* and the external characters of which he had pointed out in the 'Magazine of Natural History' for September 1857 p. 496. The specific name *tristriatus* is there proposed for the new species.

The skull of *Sciurus tristriatus* observes Mr Waterhouse differs from that of *Sc. Palmarum* in being a little larger considerably broader in proportion, and in having the upper surface less convex. The post orbital process is larger the width between the orbits is greater and the nasal portion is more suddenly contracted. The nasal bones are larger and narrower posteriorly. Following are the dimensions of the crania of these two species of Squirrel.

	<i>Sc. Palmarum</i>		<i>Sc. tristriatus</i>	
	unc	lin	unc	lin
Total length	1	6	1	7½
Width		10½		11½
—— between orbits		5½		6½
Length of nasal bones		5½		6
From outer side of incisors (upper jaw) } to front molar tooth		5		5¾
Space occupied by the five molars on } either side of upper jaw		3½		4½
Length of palate		7¾		9
—— of ramus of lower jaw from } front to posterior part of condyle		10½	1	0½

MICROSCOPICAL SOCIETY

The Microscopical Society of London, held their first Meeting on Wednesday January 29th at the Horticultural Society's Rooms, No. 21, Regent Street. The meeting was attended by upwards of a hundred members and visitors.

The President Professor Owen, announced that since the provisional meeting on the 20th of December, for the purpose of forming the Society, the number of members had increased to one hundred and ten, and a further addition of twenty nine names was announced in the course of the evening, making a total of one hundred and

thirty-nine original members of the Society, it having been determined that those who joined the Society on or before the first night of meeting should be considered original members.

Mr Owen communicated a paper on the application of Microscopic examinations of the structure of teeth to the determination of fossil remains. After alluding to the essential service rendered by the microscope to the chemist, mineralogist, and vegetable physiologist, he proceeded to offer a few examples of the utility of the microscope to the geologist when applied to the investigation of the structure of fossilized teeth.

The first example adduced was that of the *Saurocephalus*, an American fossil animal which had been referred to the class of reptiles. After pointing out the destructive characters of the microscopic texture of the teeth in reptiles and fishes, it was shown that the *Saurocephalus*, according to this test, unquestionably belonged to the latter class, and that it most closely resembled *Sphyrana* among recent fishes in its dental structure.

The second instance was the *Basilosaurus* of Dr Harlan, which had been referred to the class Reptilia, and the double-finged structure of its teeth had, on the strength of its supposed Saurian affinities, been adduced to weaken the arguments advanced in favour of the mammiferous nature of certain fossils from the Stonesfield oolite. Mr Owen, after describing the microscopic character of the teeth of the *Basilosaurus*, showed that it deviated from the Saurian structure in this respect as widely as the *Saurocephalus*, but that the modification of its dental structure resembled most closely that of the cachalot and herbivorous Cetacea. Lastly, Mr Owen alluded to the difference in the views entertained by Cuvier and M. de Blainville, as to the affinities of the megatherium, which was referred by the one to the family of the Sloths, and by the other to that of the Armadillos, after explaining the well-marked differences in the microscopic characters of the dental structure in these two families of the so-called Edentata. Mr Owen proceeded to describe the structure of the teeth of the megatherium, and to show that in its close resemblance to the dental structure of the sloths, it confirmed the views of the great founder of the science of fossil remains. This paper was accompanied by a number of very beautiful illustrative drawings, exhibiting the minute structure of the teeth of the animals referred to.

Mr Jackson then read a short paper drawing the attention of the Society to a mode of mounting the compound microscope, which differs in some particulars from the methods generally adopted. The principal object to be kept in view in the construction of the

instrument is the prevention of those accidental vibrations which so much interfere with microscopic examinations, especially in the neighbourhood of crowded thoroughfares. This object is effected by connecting together the body and stage of the instrument in such a manner that whatever vibrations are communicated to the one shall be equally communicated to the other. In the instrument of Mr Jackson this principle has been carried further than has hitherto been effected, and it also affords improved facilities for minute adjustments, and the accurate admeasurement of microscopic objects.

A discussion ensued on the subject of Mr Jackson's paper, and also on the best methods of measuring microscopic objects and the greater difficulties encountered in ascertaining the antero-posterior diameters of minute bodies as compared with the facilities which we possess of obtaining lateral measurements. The meeting then resolved itself into a conversation during which a number of interesting objects were exhibited by individual members many of whom had their microscopes upon the table.

The meeting adjourned at 11 o'clock.

Wednesday February 19 1840 R H Solly Esq in the Chair.

A paper was read by Mr Quekett on the development of the vascular tissue of plants, in which it was shown that the membranous tube of vessels originated from a cytoblast in a manner similar to that described by Schleiden in the formation of cells* from which at first it is difficult to recognise them but in a short time they assume a very elongated form and the cytoblast disappears. Before the fibre is deposited, the contents which are gelatinous are crowded with numerous most minute granules, which possess the motion known as active molecules and after a short time when they have become a little enlarged they adhere to the inner surface of the tube containing them in a different manner for each vessel, so that the several varieties of vascular tissue are not degenerations of each other but are each constructed originally on the plan they are always observed to present to the eye.

It had been conjectured by Schleiden that a current existed between the gelatinous contents of the cell and its walls which preceded the formation of a fibre and gave the direction it afterwards took, this was refuted by showing that the granules become separately attached to the inside of the vessel, a little distance from each other beginning first at one end and proceeding to the opposite the fibre elongating like a root by the materials of growth being

* See Taylor's Scientific Memoirs, vol II p 281

always added to the point. The granules so attached becoming nourished by the contents of the vessel and the spaces between them are in a short time obliterated by the fibre acquiring a defined border which completes its development.

This act is the one observed in the formation of the fibre of all vessels but the arrangement of the granules differs so as to constitute the several varieties. In the annular vessel the granules attach themselves horizontally, forming rings. In the spiral they become inclined and by continuing this direction around the interior of the membranous tube the peculiar character of the vessel is obtained. In the reticulated each division or branch of the fibre or granule becomes enlarged in the line and forms the starting place for the fresh direction of the fibre. In the dotted and scalariform vessels, the fibres become so reticulated as to have portions of the outer membrane of the vessel without any deposit within and this spot, so left constitutes the dot or linear marking seen in these vessels.

This dot is plain in all such vessels excepting those found in woody exogens where it possesses (from a slight difference in structure) a central mark analogous to that on the woody tissue of coniferous plants with which Mr. Quekett considers it identical but only of a smaller size. The paper was illustrated with numerous diagrams which gave representations of the successive stages of the minute process Mr. Quekett had observed.

ROYAL IRISH ACADEMY

November 11, 1839.—Mr. Ball read a paper “on the *Bolina Hibernica*,” by Robert Patterson, Esq., Member of the Natural History Society of Belfast.

In a note appended to his paper on the *Cydippe Pomiformis* (Trans. R. I. A., vol. xix. part 1, page 96) the author had mentioned the occurrence on the Irish coast of a species of ciliograde, which he had named provisionally *Bolina Hibernica*. A large number having been taken in the bay of Bangor, county of Down, on the 11th of July 1839, the drawings now brought forward were executed from living specimens.

The movement of this *Beroc* was stated to be less vivacious than that of the *Cydippe Pomiformis*, and it is much more susceptible of external injury. The long-continued action of certain portions of the cilia, after the animal was broken to pieces, was mentioned, the variety of aspect presented by the tentacula described, and the situation of certain whitish cords or vessels minutely detailed. The lobes of the mouth were shown by the figures not to occupy more

than one fifth of the entire length. The body is transparent, and, when agitated in the dark becomes highly luminous—a property not possessed after death.

In conclusion, the author enumerated the localities in which it had been hitherto observed, and proposed some brief specific characters by which it might be distinguished.

November 30.—Mr. Ball read a paper “on a Species of *Loligo* found on the Shore of Dublin Bay about three years ago. Its dimensions are the following—

Extreme length, to the end of tentacula,	10 0 inches
Do of the body or mantle	3 1 ,
Do of the head	1 6
Average length of arms	2 8
Length of tentacula	6 0
Breadth of fin	3 0 ,
Length of fin	1 3 „
Extreme breadth of body	1 7
Length of dorsal lamina	3 5 ,
Extreme breadth of dorsal lamina	0 2 ,
Breadth of largest horny hoops of acetabula about	0 2 „

It was thus shown to be of much shorter proportions than the *Loligo vulgaris*. Its body is urn-shaped. The large fin, which is somewhat inequilateral, approximates to an ellipse in form, and resembles not a little the fin of *Loligo Brongnartii*, as figured by Ferussac, to which it also bears likeness, in the structure of its five-ribbed dorsal lamina, but it differs from this animal in its general proportions, and in the horny hoops of its acetabula which have in each of the twelve largest in the tentacula about thirty-six sharp and equal teeth. The general form of the whole animal much resembles *Onychoteuthis Leachii*—a cephalopod of a different genus, with which it may be confounded by a casual observer. Mr. Ball proposes to name the species *Loligo Eblana*.*

In addition to the foregoing, the following species of *Loligo* have fallen under Mr. Ball's notice, as occurring in the Irish seas—

Soligo sagittata var. differing in the shortness of its tentacula from the figure given by Ferussac. Several specimens were taken off the coast of Cork by George Allman, Esq.

Loligo vulgaris

Loligo media .

* The ancient name of Dublin.

Loligo media var — easily distinguished by its greater proportionate length of body, and by the shortness of its tentacula from the true *L. Media*, in the form of the fin terminating its mantle, it strongly resembles *Loligo subulata*. A few specimens, obtained on the coast of Down by the late J. Montgomery, Esq., were submitted to Mr. Ball's inspection by W. Thompson, Esq. *

December 9 — Mr. Lloyd exhibited a specimen of the Vegetable Flannel described in p. 359 of our 4th volume, brought by him from Berlin. He at the same time laid on the table of the Academy a specimen of a very similar substance, which he had received from Sir John Herschel, and which was found investing the rocks at the mouth of one of the rivers of Southern Africa. It resembles the other very much in external appearance except that the fibres are coarser and more compactly matted together. It appears to consist almost entirely of *conferva*, but apparently of a different species.

MISCELLANEOUS

ON *DATISCA CANNABINA* AND IMPREGNATION

Dr. Fresenius has observed that in *Datisca cannabina*, when female plants remain isolated they are able nevertheless to produce ripe fruit in abundance and he thinks he is justified in concluding that this and other purely female forms are, in the absence of male organs, endowed with the capability of developing by a purely vegetative process the highest vital product the terminal bud. In the summer of 1837 a female specimen of the above plant in the Frankfort botanical garden, developed a stem from its root which now bears male flowers also — *Linnæa* Part III 1839

ON A NEW GENUS OF CEPHALOPODA

M. Eschricht has given in the Transactions of the Academy of Copenhagen a description of a highly remarkable Cephalopod from Jacobshavn, in Greenland as a new genus, under the name *Cirro-teuthis Mulleri*, with the following character "Octopus suctoris minimis unam seriem in quovis brachio formantibus, brachius cir-

* Since the foregoing was written, Mr. Ball was favoured with an inspection of Cuttle-fish bones, found at different times on Magilligan Strand, county of Donegal by Mr. Hyndman, of Belfast. They seem to be those of *Sepia rupestris* as in Perussac's third plate of *Sepia*. His attention was also directed to the bones of Cuttle-fish, found in the stomachs of *Delphinus melas* and *Hypetodon*. They belonged to a species of Cephalopod he has not yet determined. As he purposes writing a monograph of the Cephalopoda of the British Islands, he requests information on the subject from all who can afford it.

ratis et cum membrana natatoria vel cum plicis ejus pendulinis usque ad apicem fere connatis alis natatoriis duabus transversalibus vertebræ cartilagineæ corporis insertis Suctorius singulorum brachiorum 30 cirris 32 Length of body $3\frac{3}{4}$ " of the arms $4\frac{1}{2}$ " — *Wiegmann's Archiv*, Part V 1839 Berlin, 1840

DERIVATION OF THE *LEFF* AND THE *LOCUSSO*, TWO SPECIES OF ABYSSINIAN GRASSES

The cultivation of the seed of the *Leff*, brought to Europe by Ruppel has shown that this grass is the *Poa abyssinica* Jacq* and that the drawing of Bruce, although somewhat rude is also to be referred to the same plant The *Locusso* which Bruce likewise mentions is according to the specimens cultivated from Ruppel's seed an *Eleusine* very similar to *El indica* but yet forming a new species *Eleusine locusso* This grass is principally cultivated on hills for the brewing of beer — *Linnaea*, Part III 1839

THE SNAKE NUT

This extraordinary vegetable curiosity is a nut about the size of an ordinary walnut, nearly round, and of a fine brown hazel colour, and very light When broken the kernel is found to bear so striking a resemblance to a snake that it is always called the *snake nut* It grows in the marshes of British Guiana Had we only examined one specimen we should have taken it for a *lusus naturæ*,—a merely accidental resemblance to the 'snake' assumed by the kernel in shrinking, but the gentleman who favoured us with a sight of it has several of the nuts, and they are all like which circumstance together with the name which has been given to it in the country where it is produced, proves that it is not a mere freak of nature but a regular natural production We do not recollect ever having heard or read of the species of nut which we have here briefly described, and if any of our readers can, and will throw some light on the subject we shall be much obliged for the information The specimens of the snake nut which we have seen were brought home by the *Palmyra* which arrived lately in this port from Demerara — *Liverpool Mercury* Jan 17

The unknown Correspondent from whom we have received the above is informed that a Description and Drawing of the Snake Nut was communicated by Mr Schomburgk to the Linnæan Society, in June, 1837

* The identity of the plant produced from the seeds brought home by Bruce under the name of *Leff*, with the *Poa Abyssinica* of Jacquem was pointed out by Solander in 1789, in the first edition of "*Hortus Kewensis*," vol 1, p 100 But Bruce's figure, making every allowance for its rudeness, cannot possibly be referred to the same grass

M VON HUMBOLDT ON DARWIN'S VOYAGE, AND ON SCHOMBURGK'S
EXPEDITION

'The volume of Mr. Charles Darwin is an admirable Supplement to the voyage of the *Beagle* it is one of the most remarkable works that in the course of a long life, I have had the pleasure to see published. Mr. Darwin unites to sagacity for detailed observations enlarged views in general physics, I should rather say in natural philosophy—views which embrace at once geology the geographical distribution of plants and the influence of temperature on the organic types of the primitive world

Mr. Schomburgk continues to explore with the same ardour. I hope that he will reach the Cerro Duida, the forest of *Bertholletia* and the mission of Esmeralda, where I was almost devoured by mosquitoes. May this excellent young man, my countryman always enjoy the kindness of your illustrious Society! —*Letter of M. von Humboldt in the Transactions of the Geographical Society*, vol. ix. p. 50

METEOROLOGICAL OBSERVATIONS FOR JAN., 1840

Chuswick — Jan 1 Overcast fine 2 Very fine 3 Fine slight rain 4 Rain 5 Cloudy and fine frosty at night 6 Frosty 7 Clear and frosty severe frost at night 8 Severe frost 9 Overcast fine 10 Overcast frosty at night 11 Sharp frost 12 Frosty fine 13 Clear 14 Hazy 15 Drizzly 16 Fine 17 Foggy 18 Frosty and foggy rain 19 Boisterous, with heavy rain 20 Rain fine boisterous at night 21 Very boisterous with rain 22 Cloudy clear at night 23 Rain windy at night 24 Boisterous 25 Overcast rain fine 26 Stormy and wet 27 Clear and cold 28 Rain boisterous 29 Very fine 30 Hazy 31 Very fine

The frost was for a short time very intense between the 7th and 8th being 20° below freezing

Boston — Jan 1 Cloudy 2 Fine 3, 4 Cloudy 5 Fine 6 Fine little snow in eve 7 Fine 8 9 10 Cloudy 11, 12, 13 Fine 14, 15 Cloudy 16 Fine 17 Rain 18 Cloudy 19, 20 Cloudy stormy with rain P.M. 21 Stormy thunder and forked lightning with rain A.M. 22 Cloudy 23 Rain 24 Stormy rain in eve 25 Fine snow A.M. 26 Rain rain early A.M. 27 Fine 28, 29 Rain 30 Fine 31 Cloudy rain early A.M.

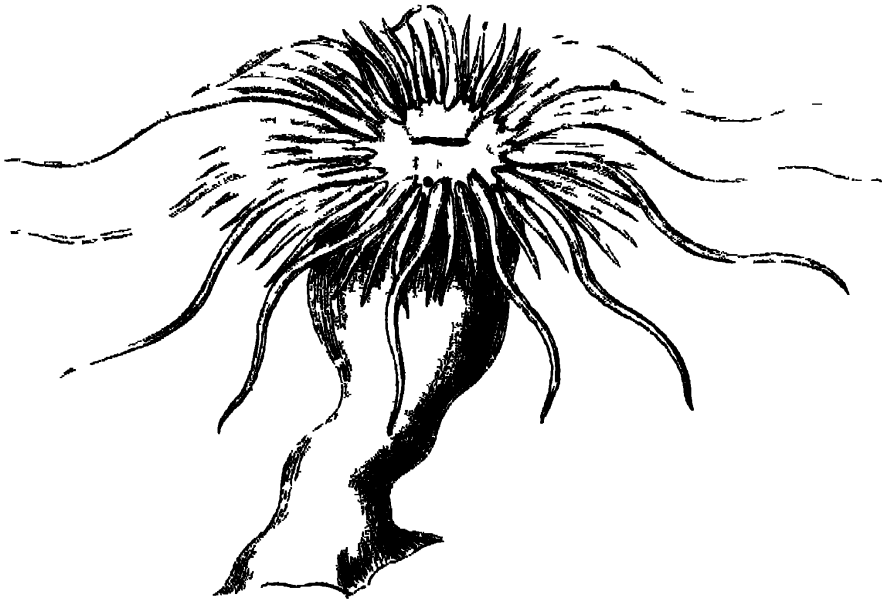
Applegarth Manse, Dumfries shire — Jan 1 Fine morning rain P.M. 2 Very wet A.M. showery all day 3 Quiet day with slight showers 4 Fine day and fair aurora borealis 5 Clear day hard frost 6 Fine frosty day 7 Dull and cloudy 8 The same thaw 9 Frost again 10 Still frosty but cloudy 11 Wet and stormy 12 The same all day 13 Fair, but threatening rain 14 15, 16 Wet and boisterous, 17 Clear and tending to frost 18 Rain again and wind 19 Heavy rain A.M. showery all day 20 Frequent showers 21 Wind very high 22 23, 24 Boisterous weather 25 The same slight showers 26 Moderate but showery 27 Succession of snow showers 28 Frost A.M. snow thaw in eve 29 Frost A.M. fine winter day 30 Frost early A.M. change in eve 31 Slight showers A.M. fine day

Sun shone out 22 days Rain fell 18 days Snow 2 days Frost 7 days

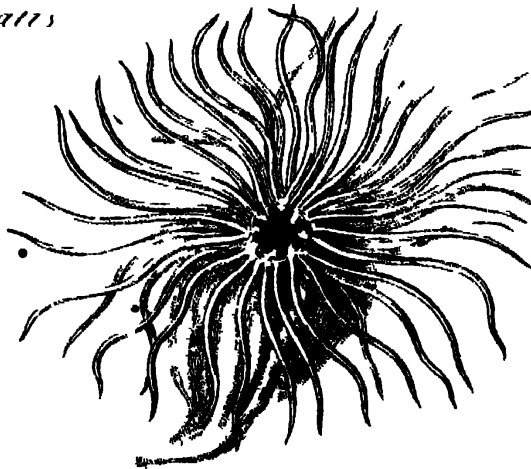
Wind north 14 days North east 5½ days East 1 day South east 5 days South 3 days South-west 9½ days West 4 days North-west 1½ days

Calm 8 days Moderate 5 days Brisk 3 days Strong breeze 9 days Boisterous 5 days Storm 1 day Temperature of spring water, taken 3 times in the month, 43° 3 Mean temperature of the atmosphere 37° 8

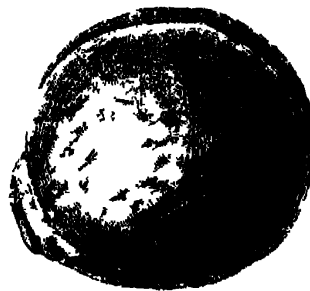
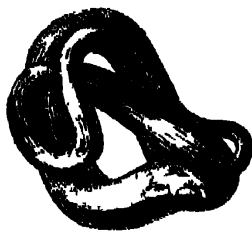
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Adonia bisectata



Thunbergia scottii



Snake Nut

ANNALS OF NATURAL HISTORY.

XVI —*On the Irregular Form, of the Flower of the Papilionaceæ* By H. WALPERS*

THE irregular form of the flower of the *Papilionaceæ* has given rise to the most varied explanations, to such an extent indeed, that the enumeration of all the opinions hitherto advanced respecting the origin of this form, which, according to the point of view in which they have been considered, differ essentially from one another, would occupy too much space to be stated here. It might consequently appear almost superfluous to increase the great number of theories advanced on this interesting subject by another, and I would on that account have held back my views, which differ from all hitherto brought forward, did I not find them to be confirmed by all the researches which I have made relative to the subject.

The pod so peculiar and so characteristic (*legumen*) belonging to the entire family of the *Leguminosæ*, must, from its disposition, be regarded as the single carpel of a five carpellary fruit. DeCandolle has already drawn attention to this, without any botanist however having hitherto made use of this fact, (proved by the pentagynous genus *Affonsea*, A. St Hilare,) in explanation of the irregular form of the papilionaceous flower. These five pods of *Affonsea* are arranged in a circle, so that their superior seminiferous sutures are situated innermost, the individual pods have therefore to be considered as *eccentric* from the imaginary floral axis which passes through the point of union of the margins of the pods. Of these five ovaries normally *four* become abortive, from reasons it is true unknown, and a single one only remains, although exceptional cases occur of two and three ovaries in *one* flower. This sole remaining ovary stands *eccentric* from

* Translated from the *Linnaea*, ein Journal für die Botanik, Part IV Vol. xiii 1839

the imaginary floral axis, and generally has lengthwise a laterally compressed form arising from the unilateral adhesion of the ovules

The pod of the *Leguminosæ* from its situation must always be viewed as that one of the five capillary fruit which is furthest removed from the floral axis,—it is then the inferior ovarium in the flower which is developed, while the four superior ones prove abortive, for I have found the *floris resupinati* of the *Leguminosæ* on more accurate examination to be constantly produced by the twisting of the peduncle. This twisting it is true usually takes place in the bud state, and descriptive botany has rarely taken this into consideration

The eccentricity of the individual ovaries from the floral axis is demonstrated not merely by the *Affonsea* which has been already mentioned, but also by those cases where several ovaries occur in one flower, thus I have observed in *Cesalpinia digyna*, Willd., Herb No 8026, that the two ovaries do not stand as might be expected with their broad sides parallel with one another, but in imperfect opposition, so that on the one (the right) side, one, and on the other (the left) side, two ovaries must be supposed to have been abortive

The calyx in all *Papilionaceæ* is composed of five sepals, corresponding to the number of petals*, these enter into the most varied cohesions *inter se*, in most cases, however, they are united at least to some extent into a tube or cup, &c and only free at the apex. Exceedingly few cases of the calyx occurring quinquepartite to the base in the fully developed papilionaceous flower are mentioned by authors, although in the embryonal state of the bud, as Schleiden and Vogel have demonstrated in their excellent 'Beiträgen zur Entwicklungsgeschichte der Bluthentheile bei den Leguminosen,' (Nov Act Ac Cæs Leop Carol Nat Cur vol xix p 1) all the subsequently cohering parts of the flower are then free, and in the course of development these parts, still consisting of delicate parenchyma, at first cohere from intimate reciprocal pressure

* Strange enough, Bischoff still describes the *corolla papilionacea* as generally consisting of *four* petals—Handbuch der botanischen Terminologie, p 333

The cause of the cohesion is correctly explained by the reciprocal pressure in the flower bud, without however contributing in any way to the explanation of the very remarkable irregularity of the flowers

The cohering-leaved calyx, however, as well as the position of the ovarium with respect to the other floral parts, appear to furnish the best explanation of this irregularity

From the double circle of anthers present in all decandrous *Leguminosæ*, and actually to be observed in the embryonal state of the floral bud, we obtain an explanation of the alternation of the petals and ovaries which we find realized in *Af-fonsea*, and indicated in the other one-podded *Leguminosa* by the position of the ovarium between the two carinal petals. This ovarium is during the flowering period in general sessile, or merely provided with so short a petiole that it does not project out of the tubular calyx. Consequently an action on the other floral parts cannot be denied to this ovarium, as it frequently attains to a considerable size, and this action is manifested by pressure on the adjacent organs, which on that account are greatly inclined to cohesions in their still parenchymatous consistency. Since the petals in proportion to the length of the calycinal tube can generally only be designated as shortly unguiculated, nay in several genera a great portion of the *lamina* is even still situated in the calyx, the lateral petals standing nearest to the ovarium cohere at their inferior margins very frequently, where the pressure which the calyx and ovarium jointly exert is most powerful, and form the carina. This pressure is even so considerable in the genus *Jonesia*, Rxb., that the petals are from the first entirely suppressed, and further the ovarium coheres at its inferior suture through its entire length with the perianthium, as I have observed in several undescribed species of this highly instructive genus. In the *Cæsalpinieæ* there are several genera with only from 1 to 3 petals, these then constantly stand in the place of the *vexillum* and of the wings (*alæ*) — Perhaps the absence of the other petals may be deduced from hence? Direct observation can only decide this question. Yet we observe in *Tamarindus Indica*, L., at the place where the two absent petals should

have stood, two minute scales, which appear to be the rudiments of the petals

The flower of the *Leguminosæ* acquires a laterally compressed appearance from the abortion of the four superior ovaries, and I am not aware of a single case where the flower of any one of this family corresponds exactly to the scheme properly deducible for it

The petals forming the carina are, as is well known, those standing nearest to the ovarium, and they must therefore, in the true papilionaceous flower, be those situated innermost, and indeed they always closely surround the ovarium and proceed perfectly parallel with it. The two following petals, or the wings, retain their original position, and place themselves, in consequence of the lateral compression of the entire flower, over the carinal leaves, with which, by the too great pressure and considerable development of the former (as in several *Phaseolæ* and many *Trifoliceæ*) they frequently cohere at their base, naturally however above the unguis. But they are generally prevented by the gamosepalous calyx from developing and spreading themselves freely as they would otherwise do. The last petal, the *vexillum*, opposed to the ovarium at its upper suture, stands both from its situation as well as position,—as may be distinctly seen in numerous *Sophoreæ*,—furthest from the ovarium, consequently meets with the fewest hindrances to its independent development, and thus frequently attains to a considerable size in proportion to the other petals. This also depends on the stronger nutriment, which in consequence of its distance from the ovarium appears to be conveyed to it through the calyx. Thus then in the bud at least the *vexillum* will be folded round the other petals and inclose them, whence arises the well-known vexilla-covering æstivation (*æstivatio vexillaris*) of the *Papilionaceæ*.

If the petals are very narrow, and the calycinal tube very long and narrow, they at times cohere through their whole length at their margins to a tube whose border exhibits five incisions which open according to the type of the papilionaceous flower, as in many *Trifoliceæ*.

If on the contrary the calycinal tube is very short and broad, and the calyx thus surrounds the other floral parts but very loosely—as in most of the *Sophoreæ*—then indeed the carina is formed of two non-cohering petals, nevertheless the papilionaceous flower is still easily recognizable. This case has also a similar action on the stamina, which are then likewise free or only cohering at their base.

The stamina, which in the *Papilionaceæ* are with few exceptions always to the number of ten, stand, as is well known, in *two circles* around the ovarium. These two circles, it is true, are in most cases, from the cohesion of the filaments, very indistinct, yet in the young bud, as also in the perfectly developed flower of some *Sophoreæ*, they are clearly to be distinguished, and they are likewise indicated in numerous other *Papilionaceæ* by the alternate similar or sterile anthers (in this case it is constantly the inner circle which is sterile), and also by the alternately longer and shorter filaments. The stamina present but a very slight surface of opposition to the outer pressure, and on that account are subject to the most varied cohesions—the more so as they are situated nearest to the ovarium, nevertheless they are always more or less free at the apex, and I am only acquainted with a few cases where the anthers are directly sessile on the staminal tube.

Hitherto the following modifications of cohesion of the stamina have been observed —

- a* The stamina cohere in a perfectly closed tube
- b* The stamina cohere in a tube slit at the upper side, either in its entire length or only partially

Here two cases are possible

- a* The staminal tube is slit from the apex downwards
- β* The staminal tube is slit from the base upwards. This is the rarer case
- c* The stamina cohere in a tube slit at the lower side along its whole length. Very rarely
- d* Nine stamina cohere to a tube slit superiorly, the tenth, belonging to the inner staminal circle, and standing opposed to the ovarium, is in its entire length free
- e* The stamina cohere in two bundles of 5 and 5 through-

out their whole length, and as these two bundles stand on each side of the ovarium, they must be imagined to have originated from a staminal tube slit superiorly and inferiorly at the same time

Of the ten stamina, *that* standing at the upper and *that* standing at the lower floral pole are free in their whole length (the first belongs to the second or inner, the latter to the first or outer circle), the other 8 stamina are situated in bundles of 4 and 4 on each side of the ovarium (This case has hitherto been observed only in *Platyodum*, See 'Linnæa,' vol. xii p. 420)

Besides these, the stamina at times cohere more or less with the petals. The case most frequently occurring is the cohesion of nine stamina to a superiorly slit tube with a tenth free filament, and is to be explained thus: the tenth stamen, opposed to the suture of the pod, stands furthest from the ovarium, and is consequently the least subjected to pressure and the cohesion arising therefrom. That this is actually the case is moreover evident from the stamina situated superiorly on both sides of the ovarium entering successively into a more and more intimate cohesion towards the inferior floral pole, so that the stamina following on each side the free stamina, which belong to the outer circle, are frequently but slightly connected with the rest, while the succeeding ones cohere higher and higher,—a statement, which will be found to be confirmed in the greater number of diadelphic *Papilionaceæ*

The other cohesions above-mentioned must also be explained in the same manner, from the general or partial, greater or smaller pressure which the stamina have to suffer from the adjacent floral parts, and there consequently exists no reason, as is also evident from the above-mentioned valuable researches of Schleiden and Vogel, for denying to the merely *mechanical* influences all action on the form and position of vegetable organs, as many botanists have done who have endeavoured to reduce all phænomena of vegetative life to the influence of higher influences, which unfortunately in most cases approaches near to scientific mysticism, by which little good is gained

Yet as there is no rule without at least an apparent exception, there may be persons who can bring forward a number of facts which appear to speak against the correctness of the theory here advanced, but these exceptions serve, as far as I have hitherto become acquainted with them, only to confirm and extend the above positions, which I only maintain for the true *Papilionaceæ* sufficiently well characterized by their *æstivatio vexillaris*

One might mention, for instance, the large groups of the *Cæsalpineæ* and *Mimosæ*, which can scarcely be separated from the family of the *Leguminosæ*, in which the almost regular five petalled corolla now and then occurs together with the characteristic pod, as not being in harmony with the law above stated for the *Papilionaceæ*, although the forms of flower which here occur are nothing more than modifications produced by that law

The *Cæsalpineæ* are distinguished in addition to the erect embryo, which is of no importance in our inquiries, from the *Papilionaceæ* by the imbricate, the *Mimosæ* by the valvate, æstivation

The former appears to be produced by the calyx in the *Cæsalpineæ* being generally quinquepartite to the base, it is therefore not able to inclose the floral parts so tightly and to press them on one another, as a gamosepalous calyx, the petals can consequently develop more freely and adopt that æstivation originally peculiar to them

In this case almost all the petals are of like size and form, they expand freely, not being prevented by the calyx, and approach in their outer appearance more to the rosaceous corolla than to the papilionaceous the stamina likewise rarely cohere *inter se*, and we here find them arranged in two circles If on the contrary the calyx is cohering (*Coulteria*, Hb B Kunth, *Cæsalpinia*, L., &c.) we immediately find the papilionaceous corolla make its appearance

Further, when the ovarium in the *Cæsalpineæ* is spherical or cylindrical, then it will be less eccentric than the usually occurring compressed ovarium, its axis will approach nearer to the imaginary floral axis than is otherwise the case, for it

will it all events adopt that position in which it meets with the least opposition, it will consequently approach the upper floral pole, where the other four abortive ovaries would have stood—an appearance which, although in a slight degree, we also find in the true *Papilionaceæ*—by which the reciprocal pressure of the individual floral parts on one another becomes more equalized. The irregularity of the flower diminishes however in the proportion in which this equality is established. The calyx in this case is nearly regular (*Hymenææ*, &c), and just so the corolla dependent on it, although frequently, as a sign of the still perceptible eccentricity of the ovarium, a slight irregularity of the floral parts is evident.

If lastly the calyx is indeed gamosepalous tubular, but if the petals are provided with claws which exceed the calycinal tube in length, or if they cohere with it in their whole length, both which cases are of frequent occurrence in the *Mimoseæ*, then all reason for irregularity of the corolla disappears of itself, the corolla as well as the calyx are regularly quinquepartite or expanded rosaceously, and since the petals are then constantly acuminate, they can no longer cover one another laterally in the bud, but are merely folded valvately (*æstivatio valvata*). The stamina here frequently occur in very considerable number, and then, in consequence of the increased pressure by the inferiorly narrow calycinal tube, frequently cohere *inter se*, although above the tube they are perfectly free. At the same time the calycinal tube is here so narrow that there can no longer be a question as to a sensible eccentricity of the ovarium, and the influence which this would exert on the form of the corolla seems to be thus suspended, from the ovarium being frequently provided with a considerably long stipes, which appears to destroy the reaction against the unilateral pressure of the calyx, since it is but feeble. In this group we find the case, already frequently mentioned, of a pentagynous leguminous plant, which we have considered of such importance in explanation of the papilionaceous flower.

EXPLANATION OF THE FIGURES

Fig 1 Diagram according to which the papilionaceous flower is constructed as regards disposition, and which actually occurs in *Affonsea*, St Hil

a, a, a, a The abortive ovaries in the papilionaceous flower, *a'* the remaining ovarium

b, b, b, b Second inner staminal circle alternating with the ovarium

c, c, c, c Second outer staminal circle opposed to the ovaries

d, d, d, d Petals alternating with the ovaries

e, e, e, e Sepals opposed to the ovaries

f Imaginary floral axis

Fig 2 Diagram according to which the papilionaceous flower is actually constructed Similar to the former, but the abortive ovaries *a, a, a, a*, are omitted

Fig 3 Diagram of a diadelphous papilionaceous flower

a Ovarium

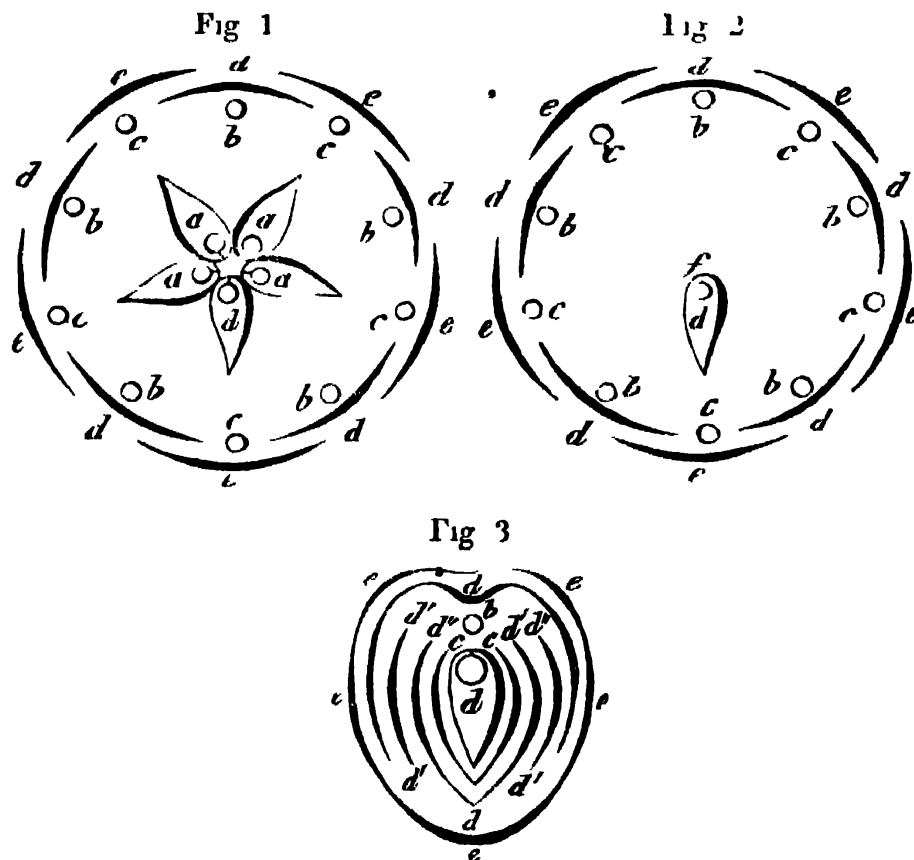
b The tenth free stamen belonging to the inner circle

c The superiorly slit tube formed of the other nine stamens

d'' d'' The two petals cohering at their inferior margin forming the *carina*

d' d' The two wings, *d* the vexilla

e, e, e, e Sections of the calyx



XVII — *On the Structure of the Ovule in Plants* By M J
SCHLEIDEN, M D , Professor of Botany in the University
of Jena*

LINNÆUS established a fixed period for the description of the organs of reproduction, namely, for the floral organs the fully developed flower at the moment of the diffusion of its pollen, for the fruit, on the other hand, the moment of maturity, *et* in general, the natural separation of the fruit from the plant, and in so doing he was perfectly right. Linnæus undoubtedly described well, for what he could not see with the naked eye or with a moderate lens he passed over in silence. But it was soon felt requisite to pay attention to parts not perceptible to the naked eye, and more especially since a preference has been given to the natural arrangement of plants has it been found necessary to take into consideration the structure of the ovule. Now-a-days, indeed, it is pretty generally the case that but few physiological botanists take the trouble to inquire into the structure of the ovule and the development of the seed, and the more systematic botanists borrow their statements upon trust and faith, or without such warrant judge of the structure of the ripe seed, *mutato nomine*, from the ovule†. He, however, who is not totally ignorant of the history of the development of plants knows very well that the gradual changes resulting from progressive development are frequently so considerable, that even the reduction of later stages to the earlier ones which have been actually observed is quite impossible without constantly following the progress of development. Thus it seems singular enough, when describers with an air of great seriousness, as if they had actually observed it with their own eyes, talk for instance of an

[* Translated from Wiegmann's Archiv, p 282 Part IV 1839 We here beg to acknowledge our thanks to the author for the kind communication of separate copies of this and other interesting Memoirs — R T]

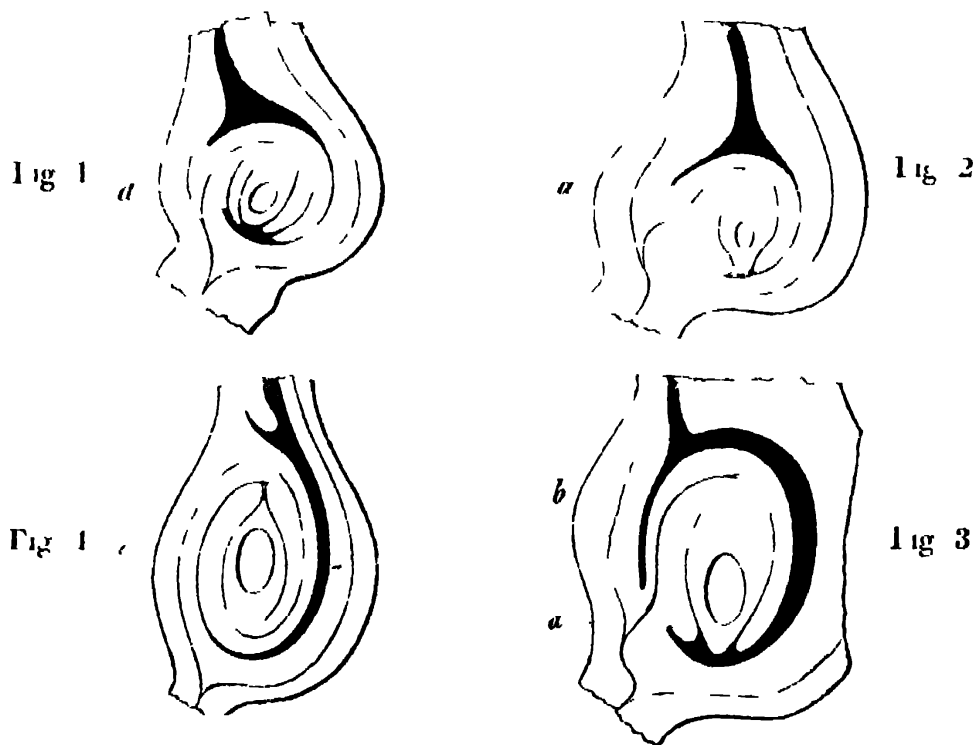
† That frequently accident or fancy have the principal share, is among other things proved by the position of the *Nymphaeaceæ* in Kunth's excellent 'Flora Berolinensis,' otherwise entirely arranged from personal and new observations. That in such a work the *Nymphaeacea* should be classed under Monocotyledons, and indeed, as *Butomeis proxime affines*, and that the researches of Brongniart, Mirbel, Brown, and Lindley should be entirely passed over is scarcely conceivable.

ovarium uniloculare, ovulo pendulo in *Viscum*, or in *Corylus* of an ovarium *biloculare, ovulis imtio erectis mox pendulis**, happily their disciples are kind enough to believe the teacher upon his word, or otherwise they might easily devote their life in vain to find such pretty descriptions confirmed by nature.

But if at last, and indeed with perfect justice, an essential value has been placed on the description of the formation of the ovule, and if we are every day more and more convinced that a plant is not a crystal which can be laid aside today, and ten years afterwards found in the same state, but that engaged in constant, active, and lively development, it sometimes manifests this side of its life, sometimes that, and thus every moment escaping the observer, it nowhere can be conceived as a process terminated in a given moment, but solely is the idea of several stages of development, and as the collective expression of an uninterruptedly continuing process, then indeed it is evident that by the present mode of proceeding science is not much advanced, and that on the one hand, a fixed moment must be established for the description of the structure of the ovule according to Linnæus's notions, but, also, on the other hand, that the progress of development must be indicated, through which apparent differences at certain periods may be reconciled with a higher unity, while apparent resemblances are resolved into their proper members according to the different principles of development. Here again Robert Brown is the name which first trod the right path and indicated what is required of us, although, as in many other cases, without any one making use of or following up his ingenious indications. Robert Brown, struck by the apparent contradiction in finding in the same genus (*Euonymus*) both pendent and erect ovules at the same time, inquired further, and discovered the law, that the *raphé* in the ovule constantly passes along the side directed towards the *placenta*, that in the *ovula pendula* of *Euonymus* this is not the case, but that they become *ovula erecta*, if in imagination we again bring the *raphe* into the right position, that therefore the ovules of this plant are only apparently pendent (pro-

* Of course, *ovarium* in its state at the time of flowering is here intended

peily speaking curved downwards), but in reality erect. The correctness of this statement is confirmed by the history of development. As far as I am aware, no one has profited by these inquiries of Brown, in order to solve similar anomalies which obscure the clear perception of affinity, for which object the *Ranunculaceæ* present an excellent opportunity. The one-seeded plants of this family have been divided according to the difference of pendent and erect ovules (?) into *Ranunculaceæ* and *Anemoneæ*, and botanists have remained content with believing in such an important distinction even between plants so nearly allied to each other. But the ovule in these two divisions is at a not very early state exactly similarly constructed, and is *ovulum adscendens anatropum*, figs 1—2, at a subsequent period the *ovarium* either grows alone upwards, when we have an *ovulum erectum anatropum*, fig 3, or the ovarium is compelled to employ for its development the space



below the ovulum, which then curves from the *placenta* downwards and becomes *spuria pendulum*, *anatropum raphe aver sa*, fig 4. In several species no difference is perceptible at the time of flowering (for instance between *Ranunculus* and *Myosurus*), and in all the others intermediate forms run so gra-

dually together, that the difference alluded to is absolutely incapable of being employed as a ground of division at the time of flowering, when the seeds are ripe it then indeed affords a well-defined distinctive character. But since we have genera which cannot be divided (*Euonymus*) in which this double form occurs, such a character can in no case be made use of to establish and justify a division, unless nature evidently indicates it otherwise, and indeed the less so, when, as in *Ranunculacea*, nature has set no value on the structure itself of the ovule, and when peculiarities otherwise most constant within the limits of family are found to be among the most variable. Of this nature is the number of integuments of the ovule, which in *Ranunculaceæ* vary even in the same genus.

With an *integumentum simplex* there are, *Thalictrum*, *Anemone*, *Hepatica*, *Ranunculus*, *Ficaria*, *Caltha*, *Helleborus*, *Delphinium tricornis* and *chinense*, and the *Podophylleæ*.

With an *integumentum duplex* there are, *Clematis*, *Adonis*, *Trollius*, *Isopyrum*, *Aquilegia*, *Aconitum*, *Pæonia*, *Delphinium fissum*, *clatum*, *bicolor*, *consolida*, *Ajacis*, and the *Magnoliacea*.

So great is the difficulty of examining most plants of this family with reference to the original structure of their ovule, which in general is no longer to be recognized even in the developed bud, that I will not assert that some error may not have crept into the preceding enumeration (perhaps in *Delphinium*). But if, as I trust, the greater part is correct, then the conclusion is justified—that the number of integuments, which is of fixed constancy in most other families, here appears as a totally variable and consequently secondary character, according to which alone the family can neither be restricted nor extended.

An example of similar anomalies also occurs in the family of the *Aroidæ*. Here there is nothing constant in the formation of the ovule, but the *integumentum duplex* pertaining to all Monocotyledons. We find moreover in this family *ovula erecta* (*Arum*), *pendula* (*Pothos*), *atroca* (*Saurumatum*), *hemianatroca* (*Meconostigma*), *anatropa* (*Calla*), and even *hyperatroca* (*Orontium aquaticum*). Robert Brown united *Typha-*

reæ with *Aroideæ*, Lindley subsequently separated them, and as it appears*, chiefly on account of the pendent ovules. Not to mention that the ovules are not unfrequently pendent in *Aroideæ*, which Lindley has forgotten, it is also to be observed that the ovules in *Typhaceæ** are only *spuriè* pendent, for in them also we meet with the *raphe aversa*.

DESCRIPTION OF THE FIGURES

- Fig 1 Adonis vernalis* Longitudinal section of the *ovarium* just before the expansion of the flower
a Placenta In the fully developed flower, the form of the ovulum scarcely changed
Fig 2 Ranunculus repens The same
Fig 3 Ranunculus repens Just after the expansion of the flower
a Placenta, —b Raphe
Fig 4 Anemone nemorosa Just after the expansion of the flower
a and b As in the preceding figure

XVIII — *On the Bone of an unknown Struthious Bird of large Size from New Zealand* By RICHARD OWEN, Esq, F R S

THE bone of an unknown Struthious bird of large size, presumed to be extinct, has been placed by Mr. Rule, in the hands of Professor Owen for examination, with the statement that it was found in New Zealand, where the natives have a tradition that it belonged to a bird of the Eagle kind, but which has become extinct, and to which they give the name "Movic." Similar bones it is said are found buried in the banks of the rivers.

The following is an abstract of Professor Owen's account of this bone, communicated to the Zoological Society, Nov. 12.

'The fragment is the shaft of a femur, with both extremities broken off. The length of the fragment is six inches, and its smallest circumference is five inches and a half. The exterior surface of the bone is not perfectly smooth, but is sculptured with very shallow reticulate indentations. It also presents several intermuscular ridges. One of these extends down the middle of the anterior surface of the shaft to about one-third from the lower end, where it bifurcates, two

* Upon a reference to Lindley's 'Natural System of Botany,' ed. ii p. 365, it will be found that this is not an exact statement. That author's words are "They (*Typhaceæ*) are generally regarded as a distinct tribe by most writers, and are surely sufficiently characterized by their *calyx being 3-sepalled and half glumaceous, or a mere bundle of long hairs, long lax filaments, clavate anthers, solitary pendulous ovules, and peculiar habit*." —L.D.

other ridges or lineæ asperæ traverse longitudinally the posterior concave side of the shaft, one of them is broad and rugged, the other is a mere linear rising

“ The texture of the bone, which affords the chief evidence of its ornithic character, presents an extremely dense exterior crust, varying from one to two lines in thickness, then there occurs a lamello-cellular structure of from two to three lines in thickness. The lamellæ rise vertically to the internal surface of the dense wall, are directed obliquely to the axis of the bone, decussate and intercept spaces which are generally of a rhomboidal form, and from two to three lines in diameter. This coarse cancellated structure is continued through the whole longitudinal extent of the fragment, and immediately bounds the medullary cavity of the bone, which is about one inch in diameter at the middle, and slightly expands towards the extremities. There is no bone of similar size which presents a cancellous structure so closely resembling that of the present bone as does the femur of the Ostrich, but this structure is interrupted in the Ostrich at the middle of the shaft where the parietes of the medullary, or rather air-cavity, are smooth and unbroken. From this difference I conclude the Struthious bird indicated by the present fragment to have been a heavier and more sluggish species than the Ostrich, its femur, and probably its whole leg, was shorter and thicker. It is only in the Ostrich's femur that I have observed superficial reticulate impressions similar to those on the fragment in question. The Ostrich's femur is sub-compressed, while the present fragment is cylindrical, approaching in this respect nearer to the femur of the Emu but its diameter is one third greater than that of the largest Lmeu's femur, with which I have compared it.

“ The bones of the extremities of the great *Testudo elephantopus* are solid throughout. Those of the Crocodile have no cancellous structure like the present bone. The cancellous structure of the mammiferous long bones is of a much finer and more fibrous character than in the fossil.

“ Although I speak of the bone under this term, it must be observed that it does not present the characters of a true fossil, it is by no means mineralized. It has probably been on, or in, the ground for some time, but still retains most of its animal matter. It weighs seven ounces twelve drachms, avoirdupois.

“ The discovery of a relic of a large struthious bird in New Zealand is one of peculiar interest, on account of the remarkable character of the existing Fauna of that island, which still includes one of the most extraordinary and anomalous genera of the struthious

order and because of the close analogy which the event indicated by the present relic offers to the extinction of the Dodo of the island of the Mauritius. So far as a judgment can be formed of a single fragment, it seems probable that the extinct bird of New Zealand, if it prove to be extinct, presented proportions more nearly resembling those of the *Dodo* than of any of the existing *Struthionide*.

“Any opinion, however, as to its specific form can only be conjectural, the form of the Stilt-bird (*Himantopus*) would never have revealed the anomalous development of the other bones of the leg, but so far as my skill in interpreting an osseous fragment may be credited, I am willing to risk the reputation for it on the statement that there has existed, if there does not now exist, in New Zealand, a Struthious bird, nearly, if not quite, equal in size to the Ostrich.

XIX — *Miscellanea Zoologica* By GEORGE JOHNSTON, M D, Fellow of the Royal College of Surgeons of Edinburgh

[Continued from vol iv p 375]

CONTRIBUTIONS TOWARDS A HISTORY OF THE IRISH ANNELIDES

A LARGE collection of Irish Annelidans has been put in my possession by my friend Wm Thompson, Esq of Belfast. The collection was made partly by Dr Drummond, Messrs Ball, Hyndman, and Allman, but principally by Mr Thompson himself, who had determined several of the species, and was well aware of the distinctions of others. As however the state of his eyes forbade him the long use of the microscope, he declined entering on their minuter examination,—a task which I have too willingly undertaken, for I was loath to lose this opportunity of having my name associated with those of the most zealous and distinguished cultivators of Irish zoology.

My attention having accidentally been called, in the first place, to the genus *Nereis*, I proceed to give the results of a careful examination of the many specimens of it in the collection, as well as of some others procured from other sources, and this will enable me to correct some blunders of a previous Essay, and to characterize anew all the species which have been hitherto ascertained to be natives of our shores. As of most natural and typical genera in every class of animals and of plants, the species appear to be numerous, and to resemble

each other so closely, that it is not, in some instances, easy to decide what should constitute their permanent diagnostics, or to express, in a few apt words, the minute shades of difference in certain organs which seem to mark them as distinct species. I am satisfied that, in this genus, the *form* of the body of specimens preserved in spirits will afford no specific character, and that as little reliance can be placed on *colour*, although this is perhaps more uniformly alike in living individuals. The *number of segments* is also, as Otho Fabricius long ago remarked*, liable to considerable variation, both from age and from mutilation, for if the posterior segments have been lost by accident they are indeed again renewed, but not in their original numbers or size, and moreover it is often very difficult to count the segments from the minuteness and crowding of the posterior ones. The pattern after which the *prickles of the proboscis* are arranged varies in some species, but it is almost impossible to define those variations in words, and the character fails us in the nearest allied species, where only it is required. Such is also the case with the *number of serratures* along the falcate edge of the jaws, though the character is one not to be neglected, but, from the peculiar shape of the jaw, I have sometimes found a difficulty in determining the exact number of these serratures, and, in other instances, have had a doubt whether one or two of them, from their obsolescence, ought to be reckoned. I place little value on any differences in the shape of the head, or in the proportions between the palpi and antennæ, but a specific character, it appears to me, may be justly founded on differences (1) in the proportion of the first or post-occipital segment to the second, (2) in the comparative lengths of the longest pair of tentacular cirri, but (3) principally in the variety exhibited by the lobes and appendages of the feet. Every foot, let it be remembered, consists of a superior and an inferior cirrus, three papillæ presumed to be branchial, and two tubercles

* "Ceterum numeravi sine respectu magnitudinis segmenta 56, 65, 76, 78, 86 in diversis, igitur de numero nil certi statui posse patet. hunc characterem etiam quam maxime vacillare facile credat, cui mutilatio et reintegrationis articulorum innotuit, sub reintegrando enim articulo caudali primum accreacente, reliquis vero successive, a momento conspectus numerus dependet."—Faun Grœnl. p. 292

armed with compound bristles,—the superior tubercle being always situated between the dorsal and second papillæ, and the inferior tubercle between this and the ventral papillæ. On these particulars I will endeavour to define the British species before me, and I trust that, with the designs which illustrate the specific characters, the student will now be able to determine, with comparative ease and certainty, such of them as he may meet with in his researches.

Genus NEREIS

(Nereis, *Cuv Reg Anim* iii 201 *Aud & M Edw Litt de la France*, ii 181 —Iycoris, (*Savigny*,) *Lam Anim s Vert* v 311 2de edit v 548) For the character of the genus see *Annals of Nat History*, iii p 289

• Feet homologous

1 *N brevimanus*, post-occipital segment not longer than the second, tentacular cirri once and a half or twice its diameter, jaws with 8 serratures, the apices unarmed, feet homologous, the branchial papillæ subequal, the inferior coalescent with the setigerous tubercle on the posterior feet, cirri very short, not reaching the apex of their lobes, setigerous tubercles well-developed, the bristles smooth

fig. 1



Nereis brevimanus

Hab Coast of Ayrshire, Mr P W MacLagan

Worm about 3 inches long, and about the size of an earthworm of the same length. Head narrow, eyes very distinct, antennæ not projecting beyond the palpi, proboscis roughened as usual with black horny spinules, the serratures of the jaws coarse but not reaching to the point, which is plain. Segments about 88, narrowed posteriorly, the anal one terminated with rather long styles. The inferior branchial lobe becomes smaller as we trace the feet backwards, and near the

middle of the body forms almost a part of the setigerous tubercle (fig *m*), the union being still more complete on the posterior pairs of feet, on which also there is a mere vestige of the ventral cirrus (fig *p*) The colour of the specimens in spirits is a wax-yellow with a tinge of brown, and a dusky line across the margin of the segments

This species very closely resembles *Nereis pulsatoria*, but in the latter the jaws are serrated to the apex, and the terminal joint of the bristles is finely serrulated along one edge

2 *N viridis*, post-occipital segment twice as long as the second, tentacular cirri once and a half or nearly twice as long as its breadth, jaws serrated to the point, feet homologous, with papillous subequal branchial lobes, the dorsal one (of the posterior feet especially) somewhat humped, superior cirrus scarcely reaching beyond the apex of its lobe, upper setigerous tubercle obsolete

Fig 2

*Nereis viridis*

Hab Strangford Lough, *Wm Thompson, Esq*, co Cork, *Geo J Allman, Esq*

To the description of this species given (under the name of *N pelagica*), in the *Annals*, vol iii p 291, I have only to add that the jaws appear to have 10 serratures on their cutting edge To show how far the feet of the same species may vary, I have given the above figures,—the three upper ones taken from an individual immediately after being killed by immersion in spirits,—the three lower ones from a specimen that had

been preserved for some years. It would have been easy to have multiplied figures exhibiting still other dissimilarities, but the pattern, though modified, is always essentially the same. Some of these differences proceed from selecting feet of non-corresponding segments, others are produced by differences in the condition of the worm when killed,—for example, from its being filled with ovaries or not, and others again from a difference in the strength of the spirits in which the specimens are placed. In some specimens which had been long preserved, the post-occipital segment was scarcely larger than the one behind, but when alive the great proportional size of the former is always very obvious.

Though the specific name is less appropriate than it might be made, I have deemed its restoration better than the imposition of a new one, for the opportunity of consulting Muller's figure, afforded me by my kind friend Mr Alder of Newcastle, has fully convinced me that this is not the *N. pelagica* of Linnæus, nor *N. verrucosa* of Muller. The true synonyms of *N. viridis* appear to be the following

Nereis cœrulea, Penn. Brit. Zool. iv. 93. pl. 27. fig. sup. edit. 1812. *Turt. Gmel.* iv. 88. *Turt. Brit. Faun.* 135. *Stew. Elem.* i. 390.—*Lycoris viridis*, Johnston in *Zool. Journ.* iv. 419.—*Lycoris margaritacea*, *Ibid.* in *lib. cit.* 420, and in *Mag. Nat. Hist.* vii. 230.—*Nereis pelagica*, *Annals Nat. Hist.* iii. 290.

3 *N. pelagica*, post-occipital segment about twice as long as the second, tentacular cirri longer than its transverse diameter, serratures of the jaw not reaching the apex, branchial lobes of the feet papillary, subequal, the dorsal one more or less humped, superior cirrus twice as long as its lobe.

Fig 3

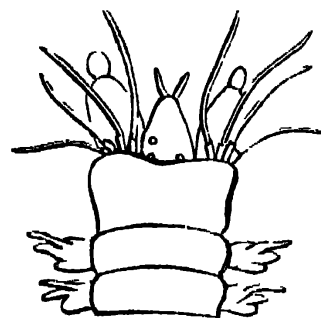
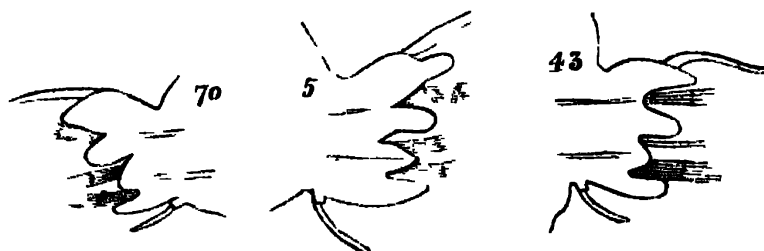


Fig 4

*Nereis pelagica*

Hab Shore of co Cork, *Geo J Allman, Esq* , Strangford Lough, *Wm Thompson* , Bangor*, *Dr Drummond* (Orkney and Shetland, and coast of the Isle of Man, *Edw Forbes* , Ayrshire, *Mr P W MacLagan*)

This species sometimes attains a length of 8 inches, with a thickness equal to that of a swan's quill. It is thicker in proportion to its length than *N viridis*, and has the organs of the head more developed. The proboscis of both species are almost exactly alike armed, but the serratures of the jaws in *N pelagica* do not reach the points, which are rather obtuse. The number of serratures on the jaw appears to be more than 10, but not more than 6 of them form prominent denticles on the edge. The segments vary from 80 to 90, and are marked with a few oblique striæ on each side above the feet, which are homologous and well-developed. The dorsal branchial lobe is rather larger than the others and somewhat humped, and from the front of the hump originates the cirrus, of nearly double its length. The inferior cirrus almost reaches to the tip of its lobe. The bristles are smooth.

The greater number of specimens preserved in spirits are of a uniform pearly nidescent colour with a slight tinge of brown or pink, but some specimens are of a dusky brown with glossy reflections.

The figure given of *Nereis pelagica* in the 'Encyclop Méthod' Vols, pl 55 fig 21—23, undoubtedly represents this species, hence it follows that it is also the *Nereis verrucosa* of Muller (Prod p 217), and of Otho Fabricius (Faun Groenl p 292). That it is the *Nereis pelagica* of Linnæus is not so certain, for his specific character—" *N segmentis XL subtus sulcata*,"—is at variance with the fact, but as I can scarcely consent that any of our great master's species should be deleted from the "Systema," I willingly appropriate the name to the one before me, 1 because such was the opinion of Muller and Fabricius; 2 because Linnæus quotes as a probable representation of his species a figure of a worm in Baxter's Opusc Subsc tab vi fig 6, with 70 segments and upwards, and 3 because it is very probable that there is not existing a species of *Nereis* with so few as 40 segments.

* It is the small town of this name on the coast of Down that is alluded to throughout the paper.

I have also scarcely a doubt of this being the *Nereis margaritacea* of Leach (Supp Encycl Brit 1 p 451 pl 26), but Dr Leach's character of the species is entirely generical, and Savigny and Milne-Edwards and Audouin have particularly described a *Nereis margaritacea*, which is not the same with the one before us, but more nearly related to *N viridis*. Neither has this any relation to the *Nereis margaritacea* of the 'Annals,' vol iii p 294, which belongs to a different section of the genus.

4 *N bilineata*

I have nothing to add to the character and description of this species given in the 'Annals,' iii p 295. It does not occur in the Irish collection.

5 *N Dumerili*, post-occipital segment equal in length to the second, tentacular cirri 3 times longer than its breadth, jaws serrulated, branches of the mid and posterior feet widely separate, the lobes papillary, divaricate, superior cirrus projecting far beyond the apex of its lobes. Aud and Edw Litt de la France, ii p 196.

Fig 5

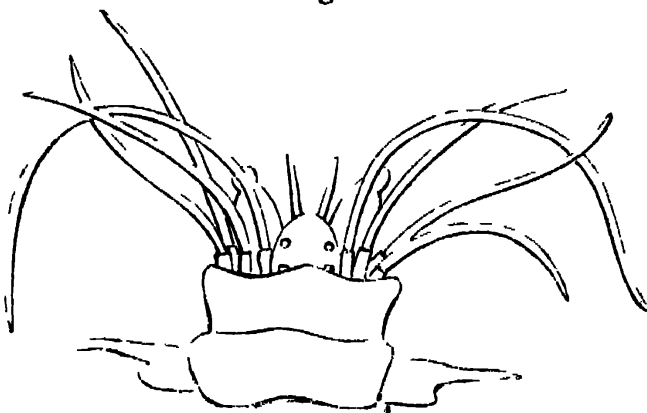


Fig 6



Nereis Dumerili

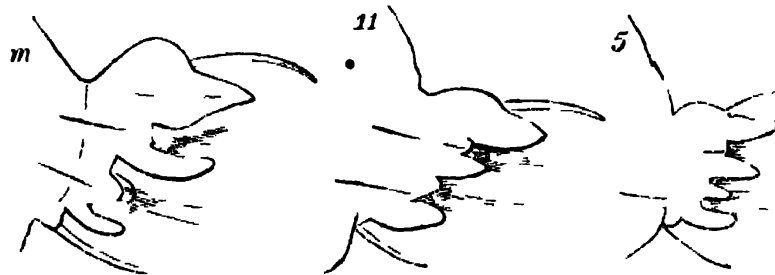
Hab Apparently not unfrequent on the Irish coast Strangford Lough, and elsewhere on the coast of Down, *Wm Thompson, Esq*, Belfast Bay, *Dr Drummond*.

Body vermiform, flattish or rarely subcylindrical, as thick as a goose-quill, only slightly tapered backwards, smooth, flat on the ventral surface, which has the median line faintly impressed. Head small, armed as usual eyes very large jaws small, with brown apices, serrated along the edge to the tip or nearly so. tentacular cirri 3 times as long as the diameter of the post-occipital segment, which is of about the same length as the next, and rather narrower. Segments about 80, narrowish, thickened above the origins of the feet, which are well-developed and most crowded on the posterior half of the body. Feet of the anterior segments with 3 short obtuse branchial lobes, the dorsal one more prominent than the others, and the setigerous tubercle minute. of the middle and posterior feet the branches are widely remote, with the branchial lobes of the superior branch nearly equal, divaricate, and a large brush of bristles between them. the inferior lobe rather small and simple. superior cirrus twice as long as its lobe. inferior cirrus rather short. spines dark brown. bristles numerous, pale yellow, smooth and slender.

In spirits the worm is generally of a uniform cream or ochre-yellow colour, with a brown line across the front of every segment, and there are two spots of the same or of a rich yellow colour at the base of the dorsal lobe of every foot. These spots appear to be constantly present, and consequently afford a good character of the species, but they are sometimes less perceptible than is desirable.

6. *N. fucata*, first and second segments nearly equal, ten-

Fig 7



Nereis fucata

tacular cirri not longer than the head, jaws finely serrated,

feet oblique, the dorsal lobe disproportionably larger than the others and more prominent, strongly humped, with a cirrus twice as long, inferior cirrus reaching to or beyond the apex of its lobe Aud and Edw Litt de la France, n p 188

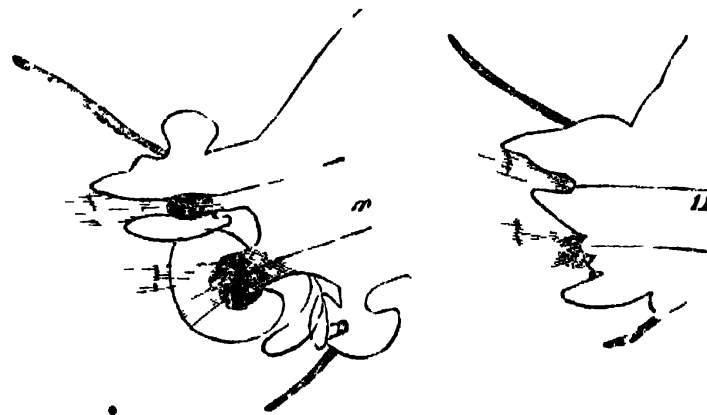
Hab Down Coast, Wm Thompson, Esq

The single specimen in the collection was about 5 inches in length and as thick as a large swan's quill the colour was a bluish grey with a pearly lustre, but the feet were a dusky reddish brown, and this colour had tinted the posterior half of the body Head small, the palpi projecting beyond the antennæ proboscis armed as usual, the jaws slender with dark brown apices, serrated along the whole fulcate cutting edge tentacular cirrus not longer than the breadth of the post-occipital segment, which is nearly of the same size as the one behind Segments about 90, with well-developed feet, which are more distinctly stalked than usual, and their lobes are very obliquely placed in relation to each other The dorsal lobe of all the feet is largest, humped, and furnished with a cirrus hanging far beyond its apex, but on the middle and posterior feet this lobe becomes greatly larger, and is raised abruptly into a large hump, in front of which the cirrus originates On the posterior extremity the hump advances, so to speak, on the foot, and leaves only a small papillary apex, over which the long cirrus hangs The inferior cirrus is longer than its lobe The spines and bristles present no peculiarity

*** Feet dissimilar, the posterior with foliaceous lamellæ*

7 *Nereis renalis*, jaws with 5 strong serratures, proboscis

Fig 8



Nereis renalis

prickly, posterior feet with 3 foliaceous lamellæ, of which the

upper one forms a helmet-shaped crest on the dorsal lobe, the mid one a large kidney-shaped leaf to the setiferous tubercle, and the other, also kidney-shaped, is attached underneath the ventral cirrus, dorsal cirrus much overreaching its lobe

Hab Bangor, Dr Drummond, (shores of the Isle of Man, Mr Edw Forbes, Belwick Bay, G J)

Body rather flattish, about 4 inches long, very slightly tapered to the tail, which is obtuse and terminated with two short styles. Head distinct, obtusely triangular, pointed in front with the antennæ, which project beyond the palpi. Eyes large, occipital proboscis armed with prickles as usual. Jaws chestnut-brown towards the apex, serrated with 5 denticulations. Tentacular cirri as long as, or longer than, the breadth of the body. Post-occipital segment rather larger than the one behind. Segments about 110, smooth, marked with two or three rugæ above the insertions of the feet, which are well-developed and crowded on the posterior half. Anterior feet normal, with short papillary branchial lobes, of which the dorsal one is the largest and most prominent. The posterior feet are complicated and much unlike the others, for above the base of the superior lobe there is a helmet-shaped compressed crest, and the superior setigerous tubercle is also furnished with a very large kidney-shaped veined leaf-like lamina, under which there is a small oblong lobe, while the ventral cirrus has appended beneath its base another kidney-shaped leaf-like lamina, and a curved lobule on its upper side. Dorsal cirrus much longer than its lobe, that of the middle feet crenated on the under side. Ventral cirrus rather long. Bristles slender, forming considerable brushes on the middle and posterior feet. Spines dark brown.

Specimens preserved in spirits are of a uniform pearl-gray colour with pale yellowish feet.

Nereis renalis is in many respects so much like the *N lobulata* of Savigny that I have hesitated in describing them as distinct species, but the dissimilarity in the structure of the feet, though apparently slight and difficult to be expressed in a definition, seems to be of a kind that nothing less than specific origin could produce. In *Nereis lobulata* the leaf-like

lamina of the setigerous tubercle is oval and not more than half the size it has in *N renalis*, and the foliaceous appendage to the ventral cirrus in the former is also proportionably small, and of a roundish figure, without any additional lobular appendage

Nereis margaritacea, described in the 'Annals,' vol iii p 294, is also nearly allied to this species, and is, I suspect, the same as the *Nereis podophylla* of Savigny. It requires re-examination, and I would remark, that as these species are easily injured, and their appendages tear and fold up readily, several feet ought to be examined before fixing on their true shape and character. I had made several figures of the feet of *N renalis* before the one now given, which, I believe, exhibits a correct outline of its ordinary conformation

8 *N longissima*, jaws obsoletely serrated at the base, plain towards the points, proboscis without prickles, upper bianchial lobe with a helmet-shaped crest, the setiferous tubercle with large kidney-shaped lamella, and a smaller one of the same figure is appended to the base of the ventral cirrus, superior cirrus rather longer than its lobe

Fig 9

*Nereis longissima*

Hab Coast of co Down, Wm Thompson, Esq

The specimen before me is of the extraordinary length of two feet! but as it has become very soft in the spirits, it would perhaps not much exceed 18 inches when alive. It is of the thickness of a goose-quill, and of a pearl colour with olivaceous feet, which are very large and flexile. Head di-

stinct, rather small, obtusely triangular, the antennæ minute and shorter than the palpi, proboscis large, destitute of all horny prickles, but armed with powerful jaws, which are only faintly serrulated near the base. Post-occipital segment not larger than the second. tentacular cirri short, not so long as the breadth of the segment. Segments very numerous. feet of the anterior pairs with 3 rather long papillary and equal branchial lobes, the dorsal cirrus not reaching much beyond their apices, but the posterior feet much resemble those of *N. renalis*.

Although the size of an animal is not usually reckoned a good specific character, yet we know that every species has in this respect certain limits which it never either much exceeds or falls short of. For this reason it seems to me impossible to regard *Nereis longissima* as a variety of *N. renalis*, notwithstanding the similarity in the structure and figure of the feet would induce that belief, and I have been fain to resort to the distinctions afforded by the jaws and proboscis for their separation. This is the only known species with a prickless proboscis, and the serratures of the jaws are likewise fainter than in any other I have examined. As the specimen of *N. longissima* is not in a good condition, some allowance will be made, should the outline given of the posterior foot be found not wholly exact, but I am confident that the general contour and proportions are accurately expressed.

Before I examined this worm I had mistaken it for a species of *Phyllodoce*, which it more resembles in size and general aspect than a *Nereis*, and it is obviously a *transition* species, proving the affinity of these two genera. The foliaceous lamellæ of the feet are quite similar in structure to the branchial leaflets of the *Phyllodoce*, and from the manner in which they are veined, are evidently also branchial in their function.

N B The numbers affixed to the figures express the number of the segment from which the foot was taken that served for the figure *m* means that the foot was from near the middle, and *p* from near the posterior extremity of the body.

[To be continued.]

XX —On the British Actiniadæ By EDWARD FORBES, Esq

* [With a Plate]

I SUCH Actiniadæ or simple soft Helianthoid Polypes as are found in the seas of Britain may be arranged under five genera, namely, *Lucernaria* (Muller), *Anthea* (Johnston), *Actinia* (Linnæus), and two which I propose to constitute under the names of *Adamsia* and *Iluanthos*, the first for the reception of the *Actinia maculata* of Pennant, the second for a new animal procured on the west coast of Scotland during last summer. As the Actiniadæ conduct us very naturally from the Zoophytes to the Actinodermata, we should expect to find some two genera more closely linking the approaching families of each great order than the other genera composing these families, such seem to me to be found among the Zoophytes in *Lucernaria* and among the Actinodermata in *Vorticella*, which I regard as a pedunculated Actinodermatous animal. By the laws of analogy such an animal should exist, corresponding with the Cinnoid Starfishes among the Echinodermata, which in like manner connect that order with the Zoophytes through the suborder Ascidioidæ on the part of the latter.

As there can be but one analogy in the tribe of the importance assumed by *Lucernaria*, the other genera are representatives of minor groups, *Anthea* standing by itself as the typical genus of the Actiniadæ. *Actinia* we may regard as a soft *Caryophyllia*, *Iluanthos* as a soft *Turbinolia*, and *Adamsia* probably as an encrusting Zoophyte.

The points of generic character among the Actiniadæ appear to be, (1st,) the general form, (2nd,) the mode of attachment, and (3rd,) the arrangement and retractility of the tentacula.

The sources of primary specific character are in *Lucernaria*, (1st,) the mode of attachment, (2nd,) the number and arrangement of tentacula, and (3rd,) the presence or absence of intermediate marginal tubercles (eyes?).

In *Anthea*, (1) the characters of the body, (2) the length, and (3) the structure of the tentacula.

In *Actinia*, (1) the arrangement of the tentacula, (2) the structure of the oral disk, and (3) the shape of the body

As there is only one species as yet known of each of the genera *Adamsia* and *Iluanthos*, it is impossible to say certainly what are the points of specific character in those genera. Probably they will depend in the first on the tentacula and colouring, in the second on the tentacula and sulcature of the body. In assigning sources of specific character I have been guided by the analogies of the genera, taking it as a *probable law*, that the points of specific character correspond in animals at once analogous and allied, and that the points of specific character in the typical genus of a tribe are mainly characteristic of the tribe itself.

II The genera of British Actiniadæ may be essentially characterized as follows —

- I ANTHEA (Johnston) *Body* cylindrical, adhering by a broad *base* *Tentacula* simple, non-retractile, surrounding the mouth
- II ACTINIA (Linnæus) *Body* cylindrical, adhering by a broad *base* *Tentacula* simple, retractile, surrounding the mouth
- III ADAMSIA (Forbes) *Body* expanded, bilobed, adhering by a broad *base* *Tentacula* subretractile, simple, surrounding the mouth
- IV ILUANTHOS (Forbes) *Body* cylindrical, tapering to a point at its posterior extremity, free? *Tentacula* simple, retractile, surrounding the mouth
- V LUCERNARIA (Muller) *Body* campanulate, adhering by a narrow *base* *Tentacula* in tufts at regular distances on the oral margin

As among zoophytes anatomical characters are of secondary generic, though of primary ordinal importance, I have not reckoned them essential. The two last genera may however be distinguished anatomically from the other three by their converging ovaries. This organization is the result, not the cause, of external form. In drawing up the above generic characters, I have borne in mind the existence of single Helianthoid Polypes wanting tentacula or with branched tentacula

Of the former the genus *Discosoma* is an example, of the latter *Thalassianthos*, both inhabitants of the Red Sea, where they were discovered by Ruppell and Lauckart

III When in Guernsey in August last, I found a species of *Actinia* frequent among the rocks at low water in the island of Herm, which I have reason to consider undescribed. It was a cylindrical species, appearing as if pedunculated, from the narrowness of the lower part of the body, about one inch and a half high and one inch across the disk. The oral disk is surrounded by numerous tapering tentacula in two rows, the inner row consisting of sixteen long tentacula, three times as long as the outer, placed at some distance from each other. The outer forms a circle of numerous shorter tentacula, about a quarter of an inch in length. The colour of the body is dark brown with blue stripes, which bifurcate towards the base. The tentacula are paler, as also the disk, which is ornamented with bright blue stripes radiating from the mouth. This pretty species I propose to name *Actinia biserialis*, and characterize as follows —

A corpore elongato-cylindrico, brunneo, cæruleo-lineato, disco rotundo, tentaculis in duabus seriibus digestis, serie internâ longissimâ, externâ numerosissima

This *Actinia* has no tubercles on the disk. The nature of such tubercles has not as yet been rightly investigated. *Actinia mesembryanthemum*, which generally has them, is sometimes without them, and so also with *Actinia viduata*, but wherever they are present in the latter species they are white, whilst in the former they are blue, an additional argument for the distinctness of the two species.

When dredging on the Manx coast in Sept. I took several specimens of *Actinia bellis**, a species which has been little noticed since Gaertner's time, and as doubts have been thrown on its specific identity, I add a note or two drawn from the living animal. The body is cylindrical, of a reddish or reddish white colour, regularly and finely striated longitudinally and transversely, and having glands of a bright yellow colour, small and not very numerous, scattered over the surface. At

* Of British authors, but not of Rupp

the oral end the body bulges, forming a calyx, on which the furrows are fewer but more granulose. When the disk is expanded, this calyx laps back, and is then almost even with the expanded tentacula. Disk angular, in my specimens square, surrounded by three or four rows of short tentacula, thickly set, of a white or brownish colour, variegated, having generally a white line down the centre of each. The disk is broad, brownish or orange, with white lines. The margin of the mouth is bright orange. The animal can project its disk forward in a pouting manner. Tentacula and disk are retractile. The specimens described were about one inch long when expanded, but I have seen larger.

IV The propriety of constituting a separate genus for the reception of the *Actinia maculata* of Adams must be evident to every one who has studied this beautiful family and has seen the species in question alive. The characters I have given above are sufficient for the genus, the species has been fully described before, both at home and abroad. On two points I have a remark to make. This year when dredging I paid particular attention to the alleged horny disk said to be secreted by the animal, and to the presence of the Hermit Crab, in the shells on which it is parasitical. Not a single specimen taken this season had either Hermit Crab or horny disk. That both such coincidences are common however may be seen by reference to a paper by Duges, "Sur une nouvelle espèce d'Actinie," in the 'Annales des Sciences Naturelles,' 2nde Série, Zoologie, vol vi p 93 pl 7 c, in which he describes this species, apparently unaware of its prior discovery. On the Manx coast in September last I found an unspotted variety. I have named the genus ADAMSIA after Mr Adams, who first noticed it, and who contributed largely to the British Fauna in an age less favourable to natural history than the present, and for the species I have retained its original appellation of *maculata*, referring to it as synonyms the *Actinia carcincopados* of Otho, the *Actinia picta* of Risso, and the species described but not named by Duges.

V Last summer, in company with Mr Smith of Jordan Hill, we dredged up among *Corbula* and other inhabitants of mud, in four fathoms water, in Loch Ryan on the west coast

of Scotland, the remarkable zoophyte, for the reception of which I have constituted the genus *Iluanthos*. It is a free *Actinia*, about an inch and a half in length, the body large above, but tapering at its posterior extremity to a point. The mouth is round and rather small, surrounded by a circle of numerous long filiform tentacula, which are nearly equal in thickness throughout their lengths. The body is of a pink colour, with regular distant longitudinal white stripes; the tentacula are greenish, with a dark line down the middle of each*. It is probable the animal fixes itself in mud by means of its attenuated extremity, which I regard as analogous to the terminations of *Virgularia* and *Pennatulula*. In its anatomy it differs not from other *Actinæ*, save that its ovaries converge. I propose to name the genus *Iluanthos*, from *ἰλὺς*, mud, and *ἄνθος*, a flower, and the species *Iluanthos Scoticus*.

REFERENCE TO PLATE III

Actinia biserialis, and *Iluanthos Scoticus*

XXI — *A short Outline of a Fauna for Part of Herefordshire* By R. M. LINGWOOD, Esq., F.L.S.

THE district included in the following list lies S. E. of the town of Hereford, and is exceedingly interesting in a geological point of view, as it comprises the Townhope Valley of Mr. Murchison's Silurian Regions, and the remainder is the Old Red Sandstone, it is about ten miles long from N. E. to S. W., and six broad from N. W. to S. E. I have thought that a list of the animals and birds might not be unacceptable to some of your readers. I have followed the nomenclature of Jenyns's British Vertebrata.

MAMMALIA

Meles Taxus (Badger) Not uncommon

Mustela Putorius (Polecat) Common

—— *vulgaris* (Weasel) Common

—— *Erminea* (Stoat) Common. I have a specimen shot in February of this year, quite white except the back of the head and the tip of the tail.

* Resembling very nearly the tentacula of Rupp's *Actinia filiformis*.

Lutra vulgaris (Otter) One or two generally frequent the river
Lug

Canis Vulpes (Fox) Common

Talpa Europæa (Mole) Common

Sorex Araneus (Common Shrew) Common

—— *fodiens* (Water Shrew) Meadows by river Lug

Ermineus Europæus (Hedgehog) Not very general

Rhinolophus Hipposideros (Lesser Horse-shoe Bat) Over the
kitchens at Sufton Court

Vespertilio Noctula (Noctule) Found 47 individuals in a hole
in an ash tree

Vespertilio Pipistrellus (Pipistrelle)

—— *auritus* (Long eared Bat)

Sciurus vulgaris (Squirrel) Very plentiful

Myoxus avellanarius (Dormouse) Not general

Mus sylvaticus (Field Mouse) Common

—— *Musculus* (House Mouse) Common

—— *decumanus* (Brown Rat) Common

Arvicola agrestis (Field Campagnol) Very numerous

—— *riparia* (Bank Campagnol?) I am unable to insert this
species for certainty, as only one specimen has come under my ob-
servation, and that in a damaged state

—— *amphibia* (Water Rat) Common

Lepus timidus (Hare) May 27th 1839 My attention was at-
tracted by a hare carrying something in her mouth, and upon con-
cealing myself she passed within two or three yards of me and I di-
stinctly saw she was carrying a leveret a week old her purpose
seemed concealment, as she took it into some thick fern, and I saw
no more of her

—— *Cuniculus* (Rabbit) Common A black var is not uncom-
mon, and occasionally a yellow var is seen

AVES

Falco Tinnunculus (Kestrel) Common

Accipiter fringillarius (Sparrow Hawk)

Milvus Ictinus (Kite?) Only inserted on the authority of my
gamekeeper

Buteo vulgaris (Common Buzzard)

Otus Brachyotos (Short-eared Owl) A single bird killed Nov
1839

Strix flammea (White Owl) Common

Syrnium Aluco (Tawny Owl)

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- Lanius Collurio* (Red-backed Shrike) Not common
Muscicapa luctuosa (Pied Flycatcher) A pair shot June 1839
Turdus viscivorus (Missel Thrush)
 ——— *pilaris* (Fieldfare) Common in winter
 ——— *musicus* (Song Thrush) Common
 ——— *ilicis* (Redwing) Common in winter
 ——— *Merula* (Blackbird) Common
Accentor modularis (Hedge Accentor) Common
Sylvia Rubecula (Redbreast) Common
 ——— *Luscinia* (Nightingale) Not common
 ——— *Atricapilla* (Blackcap)
 ——— *cinerea* (Whitethroat) Common
 ——— *sibilatrix* (Wood Wren) Common
 ——— *Trochilus* ? (Willow Wren)
 ——— *Hippolais* (Chiffchaff) Common
Regulus aurocapillus (Gold-crested Regulus)
 ——— *ignicapillus* (Fire-crested Regulus) The latter appears
 the more plentiful species
Motacilla alba (Pied Wagtail) Common
 ——— *Boarula* (Gray Wagtail)
 ——— *flava* (Yellow Wagtail) Not common
Parus major (Great Titmouse) Common
 ——— *cæruleus* (Blue Titmouse) Common
 ——— *palustris* (Marsh Titmouse) Common
 ——— *ater* (Cole Titmouse)
 ——— *caudatus* (Long tailed Titmouse) Common
Alauda arvensis (Skylark) Common
 ——— *arborea* (Wood Lark) Common
Emberiza Schæniculus (Reed Bunting) Common
 ——— *Citrinella* (Yellow Bunting)
Fringilla Cælebs (Chaffinch) Common
 ——— *domestica* (House Sparrow) Common
 ——— *Chloris* (Green Grosbeak)
 ——— *Carduelis* (Goldfinch) Common
 ——— *cannabina* (Common Linnet)
Pyrhula vulgaris (Bullfinch) Common
Sturnus vulgaris (Starling) Common
Corvus Corax (Raven) Breeds in Stoke Park
 ——— *Corone* (Crow) Common
 ——— *frugilegus* (Rook) Common
 ——— *Monedula* (Jackdaw)
 ——— *Pica* (Magpie) Common

- Garrulus glandarius* (Jay) Common,
Picus viridis (Green Woodpecker) Common
Yunc Torquilla (Wryneck)
Certhia familiaris (Common Creeper) Common
Troglodytes Europæus (Common Wren) Common
Sitta Europæa (Nuthatch) Common
Cuculus canorus (Cuckoo) Heard 22nd April 1839, for the first time
Hirundo rustica (Swallow) Common
 ——— *urbica* (Marten) Common
 ——— *riparia* (Bank Marten) Common
Cypselus Apus (Common Swift) Common
Caprimulgus Europæus (Goatsucker) Not common
Columba Palumbus (Ringdove) Common breeds in great numbers
 ——— *Œnas* (Stockdove) Found a nest in a hollow tree May 1839
 ——— *Turtur* Not common
Phasianus colchicus (Common Pheasant)
 ——— *torquatus* (Ring necked Pheasant) And all intermediate varieties
Perdix cinerea (Common Partridge)
Vanellus cristatus (Lapwing) Not common
Ardea cinerea (Heron)
Scolopax Rusticola (Woodcock)
 ——— *Gallinago* (Snipe)
 ——— *Gallinula* (Jack Snipe)
Crex pratensis (Corncrake) Common
Gallinula chloropus (Common Gallinule) Common
Anas Boschas (Mallard)
 ——— *Crecca* (Teal)
Mareca Penelope (Widgeon)

REPTILIA

- Lacerta agilis* (Common Lizard) Not general
Anguis fragilis (Blind-worm) Common
Natrix torquata (Snake) Not common
Vipera communis (Common Viper) I killed one in Oct 1839, measuring 34 inches in length.

AMPHIBIA

- Rana temporaria* (Frog)
Bufo vulgaris (Toad)

Triton palustris (Warty Eft)
 — *punctatus* (Common Eft)

PISCES

Perca fluviatilis (Perch)
Cottus Gobio (Bullhead)
Cyprinus Carpio (Common Carp)
 — *Gobio* (Gudgeon)
 — *Tinca* (Tench)
 — *Rutilus* (Roach)
 — *Leuciscus* (Dace)
 — *Cephalus* (Chub)
 — *Phoxinus* (Minnow)
Cobitis barbatula (Bearded Loach)
Esox Lucius (Pike)
Salmo Salar (Common Salmon)
 — *Fario* (Common Trout)
Thymallus vulgaris (Grayling)
Platessa Flesus (Flounder) A single specimen caught with rod
 and line Dec 1839, in river Lug below Mordiford Bridge
Anguilla acutirostris (Sharp nosed Eel) } In river Lug
 — *latirostris* (Broad-nosed Eel) }

XXII — *Monograph of the Dorylidae, a Family of the Hymenoptera Heterogyna* By W E SHUCKARD, Esq

THE discovery of an insect that will, I expect, help to clear up the difficulty which has hitherto attended the completion of these genera, as yet consisting of males only, has induced me to undertake the present monograph. Although the materials with which I entered upon this task were rather scanty, they have grown upon my hands and are now coextensive with the metropolitan collections, and when we know that these comprise the collections of many individuals, all much attached to the order Hymenoptera, we must conclude that these genera are naturally poor in individuals, although the number of species that I produce far exceed all that have been hitherto described. In the genus *Dorylus* three species only have yet been noticed, two African and one Indian, but it is very questionable if one of the African species may not, understood under the name of *D. helvolus*, consist of many species from that quarter of the globe which constitute the majority of the family, for Africa is evidently

its metropolis Our present knowledge of the range of the genus *Labidus* is of much more limited extent it has hitherto been found only in the intertropical portion of the New World As confusion attends the nomenclature of the species hitherto recorded, and wherein evidently several have been included, it will perhaps repay the trouble of investigation to subject them to a critical examination, for thus only will it be possible to extricate them from the disorder into which they have fallen This has, I have no doubt, arisen from their great rarity, as probably not more than a single specimen, or perhaps specimens of a single species, have been at the time in the possession of either of the several describers, who have all attributed it to that originally published, never more than doubtfully surmising the possible existence of any but that one species, and so fully pre-occupied must they have been with this idea, otherwise the disparity of the descriptions would have evinced at once that they belonged to different insects

The situation which these genera occupy in the system, and their right to form a separate family has been latterly subjected to discussion by very competent individuals—le Comte de St Fargeau in France and Mr Haliday in our own country, who both seem disposed to unite them permanently with the social Heterogyna or Ants, and these views they have supported by many arguments It is however only latterly that they have been separated from the Mutillidæ, and by these same gentlemen, although less definitely and distinctly by St Fargeau, who calls them Genera provisionally approximated to the Heterogyna * But Mr Haliday has first raised them to a family equivalent to the whole of the social Ants, and which with them constitute his tribe Heterogyna†, and he at the

* It is by this author in the same work, 'Hist Nat des Insect Hymen (and in which he is followed by Mr Haliday), that the term Heterogyna was restricted exclusively to the Social Ants Latreille comprised within it the *Mutillidæ* also, and it thus consequently embraced all the aculeate Hymenoptera with apterous females If the distribution thus introduced is to hold, and they are to be subdivided, and each division to be considered equivalent to the other tribes, the name *Heterogyna* ought to remain with what we now understand by the *Mutillidæ*, as it is only these that have anomalous females, this sex in the tribe of Ants, as far as they are yet known, being all winged like their males, the term therefore in application to them is very inappropriate, unless in reference to other sexual discrepancies, and then it could be as legitimately applied to many other Hymenoptera I shall have occasion shortly to go more particularly into this subject, and shall then discuss the propriety of the present contents and distribution of the whole of Latreille's Heterogyna and the neighbouring groups

† Dr Leach had previously formed them into a family by the name *Dorylidae*, which he incorporated with the tribe *Mutillarides*, and he made them equivalent to the whole of the remainder of the *Mutillidæ*

same time makes the whole of Latreille's *Diploptera* intervene between them and the *Mutillidae*. I am prepared with Mr Haliday to consider them as constituting a family, but certainly not to be united at present with the Ants, nor yet can they be incorporated with the tribe *Mutillidae*, miscalled a family which distinctly contains several natural families, but they are a connecting link between the two. In favour of my opinion of their being as intimately allied to the *Mutillidae* as to the Ants, I may in the first place adduce the *argumentum ad verecundiam*—the opinions of some celebrated entomologists,—of Linnæus, Fabricius, and Latreille. It is true, Linnæus first placed the insect, which for several years singly constituted the genus *Dorylus*, in the genus *Vespa**, but he immediately afterwards transferred it to *Mutilla*†, with this note however—"Singularis species forte hujus generis". The first time that Fabricius notices it is in his *Mantissa*‡ for he does not mention it in his two preceding works, and there he says, 'Hujus generis videtur, quamvis habitus differt, nondum rite examinata. Potius forte ad *Liphias* pertinet.' and in his next work the *Entomol. Systemat.* he constructs for it the genus *Dorylus* and very truly says 'Genus singulare, instrumentis cibus mandibulis exceptis, minutissimis, attamen distinctis' and he here places the genus between the last of his genera of Ants and the genus *Mutilla*, and subsequently made no alteration in it except by the addition of two species, the claims of which will be examined below. Latreille invariably throughout all his works placed it with the *Mutillidae*, and we may conclude from this that his views never vacillated regarding its position for although his works present a gradual and progressive alteration as to the grouping of insects—not always for the better—yet in this instance he was uniformly the same, and swayed doubtlessly by his observation in his 'Genera Crustaceor. §, where he says of the two genera, of which he had there formed a distinct section of the family, "*Labidorum et Dorylorum œconomia latet, et masculi tantum noti, femina forsane apteræ et solitariae degentes. Si, ut formicarum, societates inuent, frequentius quam masculi colligerentur*" But he here places them in close approximation to the genus *Formica*. Jurine, although the founder of the genus *Labidus*, can scarcely be adduced as an authority for systematic distribution, yet he also places them in close approach to the Ants, but before *Cynips*, and puts the genus *Labidus* in juxtaposition with *Dorylus*, of which no doubt was ever enter-

* Muscun, Ludov. Ulric. Regim. p. 412

† System. Nat. ii. 967

‡ Icon. i. p. 313. 18. 1787

§ Genera Crust. et Insect. p. 124. Annotatio

tained except by St Fargeau*, although he says apparent analogy induces him to leave them together. To me however it is evident that, with the exception of the small difference in the neurulation of the wings, the genera are very much alike, and this affinity is still further proved by means of the new genus I describe below by the name of *Ænictus ambiguus*, which deprived of its wings might easily pass for a *Labidus*, it having the same kind of canaliculated peduncle to the abdomen, and legs like the latter, for neither femora nor tibiae are compressed as in the typical *Dorylus*.

In reviewing the arguments urged by St Fargeau for placing these genera with the Social Ants in opposition to the views of Latreille, I cannot think that founded upon the structure and relative proportions of the antennæ of any value at all, as in the several species of each of these genera the structure and proportions of these organs differ considerably, and besides this, in very many of the males of the Social Ants, indeed, I may say in the majority of them the scape or first joint of the antenna is not one-third of the length of the entire organ. In the structure of the mandibles, which he also cites in support of his opinion, there are, especially in the genus *Dorylus*, considerable differences in the species, and nothing can be more fallacious than to suppose that the structure of these organs in the genus *Dorylus* can possibly indicate ædificatorial habits, for they are edentate, forcipate, and considerably slighter in proportion than the male mandibles in the great majority of the genera of the well-known solitary Heterogyna. and his argument from the structure of the wing is not so strong as he might have made it if he had adduced the single recurrent nervure, which is a structure never found in the normal solitary Heterogyna, for they have invariably two recurrent nervures†. I admit that the mere absence of the females proves nothing as to the solitary habits of these genera, although I think with Latreille as above cited, that the presumption is in favour of their being so.

In confirmation of St Fargeau's views, Mr Haliday, as I observed above, has formed these two genera into a family, and has placed them in the same tribe with the Social Heterogyna, making them equivalent to the whole of this tribe, and in corroboration of St Fargeau, he says, "*Dorylidas societate victuros more Formicarum contendit Peletierus argumentis equidem gravissimis, quibus adjicienda*

* Hist des Hymenopt vol 1 p 227

† Certainly with the exception of the genus *Apterogyna*, which is another anomalous form, and which seems to be also another connecting link at a different point with the Social Heterogyna.

videntur—squamularum defectus, (alas alterius sexus caducas innuens) et mesothorax spiraculum insigne, a structura Mutillarum aliena ' Having above shown that these supposed weighty arguments of St Fargeau are not valid, I think their corroboration must fall with them, for both of these genera have very distinct squamulae (or tegulae), and the mesothoracic spiracle is also conspicuous in many of the *Mutillidae* particularly so in the few smooth and glabrous *females* of the genus *Mutilla* itself

If it had been possible consistently to overrule the plausibility of these being solitary insects from our previous ignorance of any that might have been appropriately assigned to them as females the majority of the few arguments which I shall adduce in favour of their constituting a separate family, and to intervene between the Social Ants and the *Mutillidae*, would have helped to strengthen the supposed connexion with the social tribes, which however I admit to be only a very close affinity They are these 1st The before mentioned solitary recurrent nervure to the wings, 2nd The single calcar to all the tibiae, 3rd The labrum closely shutting the oral orifice and inclosing all the internal trophi, 4th The curtailed structure of the palpi, and 5th The enormous size of the male genital organ

The first two circumstances evidently separate them from the *Mutillidae*, which in all instances have two calcaria to the four posterior legs, and two recurrent nervures to the superior wings, with the solitary exception before noticed, but it is necessary to observe that in *Dorylus* the insertion of the recurrent nervure is considerably further in advance towards the second submarginal cell than it ever occurs in any of the Social Heterogyna that have but two submarginal cells The closing of the labrum is found frequently amongst the Social Ants, but it also occurs in the Solitary Heterogyna in the female *Thynnidae* the fourth instance peculiarly separates them from both tribes, but in the fifth, the structure of the male organ, they exclusively resemble several of the Solitary Heterogyna for this is evidently both in form and size a prehensile organ, and we know that it is used as such in the males of several of the genera of these solitary insects who thus seize and carry off their females, and W S MacLeay Esq has recently informed me in a letter from Sydney, New South Wales, that this is universally the case in the New Holland *Thynnidae*, and we consequently find, where this is the case, that the male is much the largest insect This last observation is not limited to these families, for it is confirmed in the genera *Anthidium* and *Anthophora*, amongst the Bees, both of which carry off their fe-

males and are always larger than that sex. In the Ants however the males are, as far as I correctly know them, invariably smaller and frequently disproportionately so to their partners, consequently this analogy is strongly in favour of the connexion of these genera with the *Mutillidæ*, although three of the preceding speak for their union to the social Ants. I think therefore that this combination and the peculiarity incident to themselves only in the structure of their palpi warrant me in the present state of our knowledge to consider them an osculant tribe intervening between these two, and as such I shall view them.

With respect to their habits of life I have nothing positive to state, I will however hazard the hypothesis that they are parasitical. The Ants and the *Staphylini* have been supposed to represent each other in the tropical and temperate zones. In the temperate zone, and especially in our own country, the *Staphylini* are a dominant group, and the ants a secondary one. The reverse is the case within the tropics, and the lines immediately adjacent within a few degrees north and south. In our own country and throughout Europe we find several species of this northern dominant group parasitical in the nests of Ants and, *cæteris paribus*, why may there not be, where the Ants themselves are the dominant group, an analogous instance of a genus closely allied to the Ants parasitical upon them? For the genus *Bombus* is another dominant northern group which has a parasite—the genus *Psithyrus*—so like it, that they were not until latterly separated from it although sufficiently distinct, and in this genus *Psithyrus* the males greatly predominate in number. Now if I can show that the two genera *Dorylus* and *Labidus* are considerably alike and in many points analogous to the genus *Ponera* among the Ants, which although not exclusively a tropical form, yet chiefly so,—which however strays into Europe and as far north as England, but it is most fully developed in Africa and South America and another form of it wanders into New Holland*—I think it will be admitted that there is some plausibility in the supposition that these extraordinary genera may possibly be parasites upon the Social Ants, and when it is further seen that the female, which I surmise may belong to the genus *Labidus*, is both apterous and blind it becomes further probable that she may seldom quit the nest where she is a parasite, and this will in a great measure account for specimens of this sex rarely coming to Europe, as it is not to be sup-

* There are three distinct types in the genus *Ponera*, which ought to form so many sections, and these seem to follow countries, viz northern, southern and tropical.

posed that disturbing a nest of Ants for the sake of examining its contents, even if it have ever been thought of within the tropics, is there the same slight matter that it is here, and that it may be executed with the same impunity. The colonies of these insects in hot climates are very populous, and their sting much more venomous than here, the poison increasing in intensity with the degree of heat, besides which, the collectors in those climates are either natives or negroes, who would be contented with what chance might throw in their way, without exposing themselves to the possibility of a conflict with such redoubtable opponents as a colony of Ants.

I am prepared, in pursuit of the above conjecture, to show a considerable degree of resemblance, as I said just now, in many points of *analogy* between *Ponera* and the *Dorylidae*. I possess a male of the former from Western Africa, which in its minute head, large ocelli, elongate cylindrical body, and node of the abdomen very much resembles a *Dorylus*, and in the venuration of its wings it is a close approximation to *Labidus*, but notwithstanding these particulars it is but an analogy, for the trophi are totally dissimilar, and there it is a genuine Ant. I have just now stated the female which I have so often alluded to is blind, and this is the case in the species of *Ponera* that occurs in this country, the only European species of the genus, and besides which this remarkable little female has three minute spines at the apex of the abdomen, a character found in the *Ponera crassinoda* from Demerara, but which occurs, as far as I have had the opportunity of examining in no other female of any hymenopterous genus. In *Labidus* also the calcar of the four posterior legs is dilated at its base and acuminate at the apex, a character found in one of each of the calcaria of the four posterior legs of *Ponera*. These I consider all strong analogical circumstances. In conclusion I would observe that I think it extremely probable that these females are of very voracious habits, for the perfect one I possess has within its mandibles a portion of the wing of apparently a *Termes**, and the second species of which I have only the head, is attached by the mandible to the thigh of a large *Formica*, an insect six times its size. I willingly allow that an important portion of the whole of this argument wants direct confirmation as far as regards what I consider may be the female *Labidus*, for although the points of resemblance which I shall below show are many and strong, yet are they only conjectural but how shall it be proved or disproved.

* I once thought it possible that they might be parasitical upon this genus, but I speedily discarded this idea as merely a vague hypothesis.

unless by actual observation, that it does or does not belong to this genus and what its sex may be—and when may we hope for this ?

In the absence of such direct testimony, and of any insect that may be more consistently united with this little female as its legitimate partner, I shall not hesitate continuing to consider my conjecture of their identity as correct, particularly as it seems confirmed by the structure of the palpi in all

I shall here therefore terminate these general observations, and proceed with the Monograph premising that I have found it necessary throughout to give ample specific descriptions to prevent the possibility of mistake. I consider the position of the family in the system will stand thus

HETEROGYNA, LATR

SOCIALES Latr

Formicidæ, &c

PARASITICA ? Shuck

Dorylida, Halid

SOCITARIÆ Latr

Mutillidæ, &c &c

Family DORYLIDÆ, Haliday

DORYLIDÆ *Leach *

CHAR. Head transverse, small

Eyes and ocelli large and prominent

Antennæ scabrous, not geniculated

Mandibles edentate, torquate

Body elongate, cylindrical, superior wings with two or three submarginal cells and one or two recurrent nervures one calculated to all the tibia

Abdomen with the basal segment usually smaller than the following, from which it is separated by a deep incision

Table of the Genera

One recurrent nervure

Three submarginal cells .

1 LABIDUS, Jurine

Two submarginal cells

Femora cylindrical

2 ÆNICRUS, Shuck

Femora compressed

3 DORYLUS, Fab

Two recurrent nervures

4 RHOGMUS, Shuck

I have arranged the family according to what I consider their most

proximate affinities Thus *Rhogmus* by its two recurrent nervures leads off to the *Mutillidae*, and from general habit *Dorylus* closely approaches it between the latter and *Labidus* intervenes *Ænictus*, which participates in the characters of both, whilst finally taking them inversely *Labidus* distinctly points towards *Ponera* amongst the Social Heterogyna

Genus 1 LABIDUS Jurine

DORYLUS, *Lab* partly?CHAR *Body* elongate, cylindrical*Head* small, short, transverse, flat

Antennæ varying in length, usually setaceous, curved and inserted within two facial projections (forming vertical caninæ) upon the anterior margin of the nearly obsolete clypeus, the scape never more than one-fourth the length of the flagellum, the apex of which frequently extends as far back as the insertion of the superior wings

Eyes large, lateral, subglobose, and very prominent*Ocelli* large and very prominent, and placed in a curve upon the vertex

Mandibles elongate, slender, arcuate, and forcipate, always leaving an open space usually semicircular between them and the clypeus

Labrum triangular, the apex rounded, and in repose shutting down upon and inclosing the internal trophi

Maxillæ ————'*Maxillary palpi* two-jointed, shorter than the labial? **Labial palpi* two jointed, slender, the basal joint the longest*Labium* triangular

Thorax ovate, gibbous *prothorax* extending laterally to the insertion of the wings, which is at about half the length of the thorax *scutellum* transverse *metathorax* perpendicular and abruptly truncated

Superior wings usually as long or longer than the abdomen, rarely shorter,

* Latreille throughout all his works says the "maxillary palpi are at least as long as the labial, and consist of four or at least three joints" (*Palpi maxillares labialium saltem longitudine, articulis quatuor aut ad minimum tribus* — *Genera Crustacæ et Insecta*, iv 123) except in his portion of the 'Règne Animal' of Cuvier, where he says, vol v p 315, that they consist of at least four joints but he here further says of this genus, that the mandibles are shorter and less slender than in *Dorylus*, the reverse of which is the case. Now all this implies very unsatisfactory uncertainty, and I am therefore disposed to consider that Jurine is correct, and that the palpi are constructed as stated in the text. I have unfortunately not had the opportunity of dissecting a specimen, as only single specimens of any species are extant in any collection, and the extreme minuteness of the parts would involve the certain destruction of the head from the same cause. I have been unable to examine the male sexual organ, and to compare it with those of the other genera, but this is less necessary here, as the genus is otherwise very obviously distinguishable from the rest.

with one marginal and three submarginal cells, which vary in form in the species, and one recurrent nervure, which is inserted about the middle of the second submarginal cell *

Legs varying in length in the species *coxæ* large not deeply excavated above *trochanters* small, triangular *femora* and *tibiæ* cylindrical, all the latter with a single calcar at their apex, which is usually dilated at the base *tarsi* long and slender, the basal joint the most robust and the longest, the remainder decreasing in length, excepting the terminal one, which is a little longer than the penultimate *claws* armed with a minute tooth just within the apex, and furnished with a small pulvillus within their fork

Abdomen cylindrical, slightly curved, the segments frequently slightly constricted, the basal one forming a variously constructed peduncle, occasionally either flat or concave above, but most frequently transversely convex, and always separated from the following by a deep incisure Penultimate and antepenultimate segments subequal, and the terminal one strictly compressed vertically at its apex, where it is profoundly emarginate —The male sexual organ usually protruding in the form of a deeply canaliculated and emarginated plate or two acuminate compressed and curved spines †

Type of the genus, *LABIDUS Latreilli*, Jurine

As far as yet discovered, the insects of this genus are all from the New World, and I believe inter- or subtropical Their habits have not been observed nor have their females been yet detected with certainty, although it is perhaps probable that the insects I describe below as such may be so, at all events they have a decidedly close affinity to the present genus The arguments whereby I support this view will be exhibited in connexion with the insects themselves Although three species of this genus have been described, they have been attributed to the same, but that they are not identical will be shown in the synonymy As the first species was described by a patronymic, I have followed this example, and have dedicated them all to individuals distinguished for their attachment to the Hymenoptera

* The larger relative proportions of the wings in this genus is shown by a comparison of their expansion with the length of the insect, I have therefore always given both these admeasurements

† The form of this organ I regret I cannot examine, for the sake of comparison with those of the other genera of this remarkable family It must necessarily very much differ from the others, even more than they do *inter se*, from the peculiar structure of the apex of the terminal segment, but I suspect it would most resemble that of *Rhogmus*, with which the genus agrees in the vertical incision of the dorsal portion of the terminal segment

* *Peduncle subtriangular and concave above*

Sp 1 Lab Fargeavi, Shuck

Length 14 lines

Rufo-fusco-hirtus, capite thoraceque et femoribus nigris, cætera rufo-fuscus, abdomine suprâ rufo-sericeo

Labidus Latreilli, *St Fargieu* Hist Nat des Hymenop (Suites a Buffon), tom 1 p 229 1

"Head and antennæ black Mandibles brown black Thorax black metathorax prolonged in the centre of its sides into an obtuse point Abdomen, legs, and tarsi reddish brown First segment of the abdomen furrowed longitudinally above, its sides raised into a carina which terminates posteriorly in a point The whole insect enveloped in long reddish upright hair, excepting the back of the 2—5 and base of the sixth segments of the abdomen, but which are covered with a close decumbent reddish silky down Femora blackish Wings of a reddish yellow "

I have not seen the preceding insect but a comparison of its description, which is verbally translated above, with the next but one, which is the genuine *Lab Latreilli* will distinctly show that they must be different, and that the present one was incorrectly attributed I have consequently given it the name of its distinguished describer It is apparently the largest in the genus

Sp 2 Lab Jurini, Shuck

Length 10½ lines,

Expansion 20 lines

Rufo-testaceus, pubescens capiti (mandibulis antennisque exceptis) nigro, pedunculo abdominis subtriangulo, supra valde concavo, pedibus longissimis

Entirely of a reddish testaceous, excepting the vertex and the face, which are black It is throughout pubescent, excepting the metathorax and the surface of the peduncle The antennæ are long, setaceous, and curved, the scape robust, and about one-fourth the length of these organs, which are inserted about the middle of the clypeus, within two deep cavities internally acutely carinated, and these carinæ, which ascend the face, abruptly truncated at about one-third the length of the scape ocelli placed in an equilateral triangle on the vertex mandibles very long and much arched, leaving a nearly circular space between them and the clypeus

Thorax having the scutellum moderately large and prominent, not very gibbous metathorax smooth and shining, nearly perpendicular superior wings with their marginal cell lanceolate, the first submarginal pentagonal, and larger than the second, from which it is separated by a waved transverso-cubital, the second transverso-cubital straight and directly transverse, the recurrent nervure inserted at about one third the length of the second submarginal legs long, the posterior pair extending as

far as the apex of the abdomen the basal joint of the posterior tarsi very robust

Abdomen opaque, curved downwards, the segments not constricted the peduncle subtrigonal, narrower than the following, rounded at the base, concave and shining above, the posterior angles produced, and the ventral portion smooth and not produced, the terminal segment vertically but not acutely compressed at its extreme apex, where it is deeply emarginate

• In my own cabinet

This species is from Demerara I believe The difference of size prevents my considering it the type, which is the next, this, although not a conclusive point in the majority of insects, I think may by analogy be considered so here, for in the genus *Dorylus*, in which I have had the opportunity of examining many individuals of several species there is none or but a very immaterial difference in their size In the present genus I have seen but single specimens of any species To judge from the description, the distribution of colour, and the structure, are apparently the same, excepting that in the next the neuration of the wings is brown, whereas in this they are of the same colour as the body

Sp 3 Lab Latreille, *Jurine*

Length 8 lines

Rufo-testaceus, pubescens capite (mandibulis, antennisque exceptis) nigricante, pedunculo abdominis subtrigono, supra in medio plano, ad latera elevato, nervis alarum brunneis

Jurine, *Nouv Method Hymenop*, p 282

Latreille, *Genera Crustac et Insect* iv 123

————— *Nouv Dict d Hist Nat*, 2^e ed tom xvii 141

“ Body reddish, pubescent Head blackish, excepting the antennæ and mandibles, which are of the same colour as the body Ocelli are placed in a triangle on the vertex the superior wings are of a bright fulvous tint, and the nervures brown, their marginal cell is oval and elongate, the first submarginal is nearly square, the second is smaller and receives the recurrent nervure the tibiae increase in thickness to their extremity, and the calcar at their apex is broad at the base, as is also the basal joint of the tarsi

“ The abdomen is elongate and curved at its apex, the peduncle has the form of a saddle, the sides being raised ”

This insect Latreille says is from Cayenne I have not seen the species, consequently his description given in the second edition of the ‘ *Nouveau Dictionnaire d’ Hist Nat* ’ is here repeated It is very probable that he received it from M Jurine, who dedicated the species to him Others have frequently been mistaken for it, but I think its size and other peculiarities sufficiently distinguish it

from any that I know It is remarkable that this genus should have suffered neglect so long as to have had but one species distinctly recorded

*• Peduncle more or less convex

† Transverse-quadrate

Sp 4 Lab Halican, *Shuck*

Length 7 lines,

Expansion $14\frac{1}{2}$ lines

Rufo-testaceus, pubescens capite (clypeo, mandibulis antennisque exceptis) nigro, stigma alarum brunnea et abdominis pedunculo transverso-quadrate, supra in medio convexo

Lab Latreilli, Haliday Linn Trans, vol xvii p 328

Body reddish testaceous, pubescent, especially about the coxæ, beneath the peduncle, and towards the apex of the abdomen Head black, excepting the clypeus, mandibles and antennæ, which are of the same colour as the body, the latter are inserted nearer the middle of the face than usual, the carinæ behind which they are inserted terminating abruptly near the anterior ocellus The ocelli placed in a curve upon the vertex, the scape not much more than one-sixth the length of the whole antennæ the mandibles small, leaving but a small aperture between them and the clypeus

Thorax very gibbous in front, as also at the scutellum metathorax abruptly perpendicular, slightly produced laterally superior wings with their stigma brown, marginal cell lanceolate, slightly acuminate from the apex of the second submarginal, and scarcely larger than either of the two first submarginals, which are also nearly equal in size the first transverso-cubital nervure straight, and the second cubital cell receiving the recurrent nervure at about one half of its length, beyond which the cubital nervure becomes a little thickened legs short and very slender

Abdomen very shining its first segment transverse-quadrate, and a little wider than the second, the posterior angles truncated, and with a small convex elevation in the centre of its superior surface, its ventral portion scarcely produced, the third and fourth segments slightly constricted at their base, and the terminal one acutely vertically compressed at its apex, where it has a deep fissure, and the sexual organ protruding beneath in the form of a slightly convex plate, deeply emarginate, with the lateral processes very acute

In the collection of Capt King, R N and Mr Curtis

This insect is from St Paul, on the Brazilian coast It is the specimen examined by Mr Haliday, and considered as the *Labidus Latreilli* in his description of Capt King's insects, but that it is not this insect, a comparison of its description with the preceding will amply show I have accordingly dedicated it to Mr Haliday In the observations on the next species I shall mark its differences from that

Sp 5 Lab Swainsonii, Shuck

Length $6\frac{1}{2}$ lines,

Expansion 13 lines

Rufo-testaceus, pubescens, capite (mandibulis antennisque exceptis) castaneo pedunculo abdominis transverso quadrato supra subconvexo, pedibus brevis

Body of a pale reddish testaceous Head, with the exception of the mandibles and antennæ, of a bright castaneous, the carinae of the face, behind which the antennæ are inserted, very prominent, and terminating gradually in front of the anterior ocellus, the ocelli placed in a curved line on the vertex the antennæ having the flagellum at the base as stout as the scape, which is a little less than one fourth the length of the organ mandibles long and very slender, leaving a large semicircular space between them and the clypeus

Thorax in front and scutellum very gibbous metathorax perpendicular and slightly produced laterally superior wings with their nervures and stigma pale testaceous the marginal cell lanceolate, slightly acuminate beyond the second submarginal, the first of the latter narrow, pentagonal, less than the second, from which it is separated by a waved nervure the second also narrow, but growing more so towards its apex, where it is separated by a short straight nervure from the following, it is much less than the marginal cell, and has the recurrent nervure inserted about its middle, beyond which to the apex of this cell the cubital nervure is considerably thickened legs short and slender

Abdomen slightly shining, its peduncle transverse-quadrate, with the angles rounded, the surface plane, except towards its apex, where it has a slight convex transverse ridge, and is as wide as the second segment, its ventral portion slightly produced, the base of all the segments very slightly constricted, and the extreme apex of the terminal one considerably compressed vertically, where it has a deep fissure the male sexual organ protruding beneath, in the form of a deeply and concavely emarginated plate, the lateral processes of which form acutely acuminate slightly upcurved spines

In my own collection

This insect was captured by Mr Swainson in the Brazils to whose entomological exertions there we are indebted for the knowledge of several undescribed species and this I accordingly dedicate to him It is distinguished from the preceding by many particulars but most obviously by the relative proportions of the marginal and first and second submarginal cells

[To be continued]

XXIII — *Description of the Snake-nut Tree of Guiana* By
ROBERT H SCHOMBURGK, C M R G S *

[With a Plate]

FOR several years past nuts of the size of a walnut were brought from the interior to Georgetown in Demerara, the kernel of which when opened, and the membrane which covered it being removed, displayed the striking resemblance to a snake 'coiled up' There was the head, the mouth, the eyes, so complete, that one unacquainted with the fact would have believed them to be an imitation made by human hands, and not a freak of nature As is often the case with the productions of the interior, the colonists were entirely unacquainted with the mode of growth of the plant which produced these strange nuts

They were generally found after the annual swelling of the Essequibo had subsided along its banks, and for a length of time it was pretended that they grew on a creeper, and from the resemblance of its kernel to a snake, it was supposed that it might prove an antidote to snake-poison After my return from the interior of British Guiana, and while at the post Ampa at the Essequibo, I ascertained from Mr Richardson, then postholder, that the snake-nut was the fruit of a large tree, and that several grew in the vicinity of his abode I therefore embraced the first opportunity to ascend the brook Ampa in order to see it

The tree stood near the banks of the brook, as also did other trees of the same description which I saw afterwards, and this explains its fruits being so frequently found along the low banks of the islands Leguan, Wakenaam, &c, on the mouth of the Essequibo

The tree was just about ceasing to bear for the season, and began to put forth its blossoms, unfortunately they were not far enough advanced to determine without hesitation its class and order, but there is no doubt that it belongs to the natural order of *Terbinthaceæ*, nearly related to the division *Ju-*

* Communicated to the Linnæan Society, and read June 6, 1837

*glandiæ** All the buds which I opened consisted apparently of 3 stamens and 1 pistil, the calyx was imbricated, and this might have induced me to consider it a *Carya* or *Juglans*, but the leaves of the tree in question are smooth and entire, while those of the others, with the exception of two species, are serrated

It is not a *Carya*, the nut of which is 4-angulated and 4-valved, while the nut of *Juglans*, as well as the snake-nut, is 2-valved. I had requested Mr Richardson to procure me some of the flowers of the Snake-nut tree when perfectly open, but he did not succeed in drying them, which unfortunately prevented him from sending any, and I am thus obliged to wait for another opportunity of correctly describing this remarkable plant. I offer the following description meanwhile provisionally

Order ILICACEÆ

Calyx imbricatus Corolla 3 petala Drupa bivalvis 1-sperma
Vulg Snake-nut tree

Arbor excelsa, truncus glaber, cortice lævi cinereo. Folia pinnata, foliola petiolata 3—6-juga cum impari, lanceolato-ovata, acuminata, integerrima, subcoriacea, venosa, glabra, nitida. Petioli universales supra canaliculati, glibi, articulati, partiales breves. Flores paniculati, panicula in ramulis terminales subinde axillares, ramosæ, floribus brevissime pedicellatis, numerosis confertis. Calyx imbricatus. Corolla 3-petala, ovata, concava. Drupa coriacea unispermæ, unilocularis, glabra, spherica. Nux dura, glabra, bivalvis, unilocularis, nucleo albo.

Hab in sylvis Guinæe prope fluvium Fassequibo. Floret April

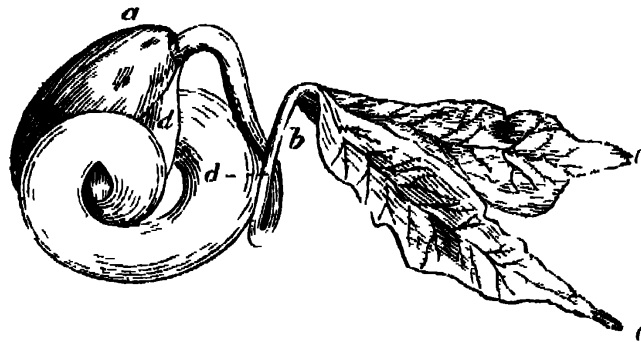
It is a tree of the first magnitude, its bark is gray, rather smooth, dividing in a few branches at a height of from 40 to 60 feet, adorned with pinnated leaves, consisting generally of four to six pairs with an odd one, the common foot stalk as well as the petioles are articulated, the former channelled, the leaves entire, lanceolate, ovate, acuminate, lucid, coriaceous, their colour between light and dark green, with a shade lighter below. The flowers appear in panicles, are pendulous, and the flower-stalks of red-brown colour, almost farinaceous, chiefly the smaller flower-stalks, verticillate and

* It stands perhaps between the *Anacardiæ* and *Juglandiæ*

sparsely flowered, the calyx is imbricated, the corolla has 3 petals, ovate and concave, and is of a lilac colour

What is most remarkable is however the fruit, a thin coriaceous drupa, with a smooth nut, the kernel of which resembles a snake most strikingly

It is covered like the walnut with a membrane, the embryo is roundish, the head of the snake becomes a claviform radicle, and the tail (Mirbel's *scapillus* or DeCandolle's '*tigelle*') bears two large foliaceous cotyledons, with several nerves, depressed, plaited, and applied to the radicle, the colour of the embryo and cotyledons is white, but the nerves of the latter are of a lake colour, as soon as exposed to the air they change into a dark-brown. When the fruit is about to germinate, the *scapillus* or '*tigelle*' bends towards the base of the cotyledons, bursts the nut, and having made room for the seed-lobes, they unfold and take an erect situation, while the rhizoma has sent its roots into the earth



No trials have been made whether the tree or its fruit possess any medicinal properties. As already observed, the resemblance of a snake has induced the populace to consider it an antidote for snake-poison. The tree appears to be peculiar to the lower part of the river Essequibo and its tributaries, at least it has not as yet been found anywhere else. It blossoms in March and April, and its fruit comes to maturity in November.

The above figure exhibits the appearance of the embryo after the outer shell has been removed. *a*, is the radicle or rhizoma, *b*, the neck, *tigelle*, or collet, *c*, the two cotyledons, which have been unfolded, as they are otherwise applied to *d d*, and partly surround the embryo.

The figures in Plate III represent the Nut and its snake-like Kernel

XXIV — Information respecting Botanical Travellers

Extracts from a Journal of the Mission which visited Bootan, in 1837-38 under Captain R. BOILEAU PEMBERTON By W. GRIFFITH, Esq., Madras Medical Establishment

[Continued from p. 125]

March 1st Proceeded to Byagur or Juggur. The vegetation continued the same, the road traversing either sward or fir woods, consisting entirely of *Pinus excelsa*. The valley in which Byagur is situated is still larger than that of Bhoomlungtung; it is drained by a large river which is crossed by a somewhat dilapidated wooden bridge; the elevation is about 8150 feet. The cultivation is similar to that of the other valley, but the crops looked very unpromising. The soil is by no means rich, and the wind excessively bleak. Wheat or barley are the only grains cultivated. The mountains which hem in this valley are not very lofty; to the north, in the back ground, perpetual snow was visible. To our west was the ridge which we were told we should have to cross, and which in its higher parts could not be less than 12 000 feet.

March 4th We commenced ascending the above ridge almost immediately on starting, surmounting this, which is of an elevation at the part we crossed of 11 035 feet, we continued for some time at the same level, through fine open woods of *Pinus Smithiana*, having descended rapidly afterwards to a small nullah, 9642 feet in elevation, we then reascended slightly to descend into the Jaisa valley. On the east side of the ridge, and that which overlooks Byagur, we soon came on snow, but none was seen on its western face notwithstanding the great elevation. The country was very beautiful, particularly in the higher elevations. I may here advert to the bad taste exhibited in naming such objects after persons with whom they have no association whatever. As it is not possible for all travellers to be consecrated by genera, although this practice is daily becoming more common, we should connect their names with such trees as are familiar to every European. As we have a *Pinus Gerardiana* and *Webbiana*, so we ought to have had *Pinus Herbertiana* and *Moorcroftiana*, &c. By so doing, on meeting with fir trees among the snow-clad Himalayas, we should not only have beautiful objects before us, but beautiful and exciting associations of able and enduring travellers. Of Capt. Herbert, the most accomplished historian of these magnificent mountains, there is nothing *living* to give him a "local habitation and a name." It will be a duty to me to remedy this neglect, and if I have not a sufficiently fine fir tree hitherto unde-

scribed in the Bootan collection, I shall change the name of the very finest hitherto found, and dignify it by the name *Herbertiana*. The prevailing tree was the Smithian pine. We saw scarcely any villages, and but very little cultivation. Jaisa is a good sized village, it was comparatively clean, and the houses were, I think, better than most we had hitherto seen. There is a good deal of wheat cultivation around the village which is not the only occupant of the valley; this is the highest we had yet seen, and is perhaps one of the highest inhabited valleys known, as it is 9410 feet above the sea, it is drained by a small stream, and is of less extent than either that of Byagur or Bhoomlungtung. The surrounding hills are covered with open fir woods and are of no considerable height. Larks, magpies, and red legged crows, continued plentiful, but on leaving this valley we lost them.

March 5th We proceeded up the valley keeping along the banks of the stream for some time we then commenced ascending a ridge the top of which we reached about noon, its elevation was 10 930 feet. The descent from this was for about 2500 feet very steep and uninterrupted, until we reached a small torrent at an elevation of 8473 feet, from this we ascended slightly through thick woods of oak, &c until we came on open grassy tracts, through which we now gradually descended at a great height above the stream which we had left a short time before. We continued descending rather more rapidly until we came to a point almost immediately above Tongsa, by about 1000 feet from this the descent was excessively steep. The distance was 13 miles. On the ascent snow was common from a height of 9000 feet upwards. The vegetation on this, or the eastern side, was in some places similar to that above Byagur. Beautiful fir woods formed the chief vegetation, until we came close to the summit, when it changed completely. Rhododendrons, *Bogh puttah*, and a species of birch and bamboos, were common, mixed with a few black pines. The woods through which we descended, were in the higher elevations almost entirely of rhododendrons, and lower down chiefly of various species of oak and maple—the former being dry and very open, the latter humid and choked up with underwood. After coming on the open grassy country we did not revert to well wooded tracts. No villages occurred nor did we see any signs of cultivation after leaving the valley of Jaisa until we came near Tongsa, above which barley fields were not uncommon. Tongsa, although the second or at any rate the third place in Bootan, is as miserable a place as any body would wish to see. It is wretchedly situated in a very narrow ravine, drained by a petty stream, on the

tongue of land formed by its entrance into the large torrent Mateesum, which flows 1200 feet below where the castle stands. The surrounding country is uninteresting, the vegetation consisting of a few low shrubs and some grasses. Of the former the most common are a species of barberry and a hitherto undescribed genus of *Hamamelidæ*. No woods can be reached without ascending 1200 or 1500 feet. Barley was the chief cultivation we saw, but the crops alternated with rice, which is here cultivated as high as 6800 feet. In the gardens attached to the cottages, or rather huts, we observed the almond and pear in full blossom. The only other trees were two or three weeping cypresses and willows, and a solitary poplar. Nothing could well exceed the discomfort we had to undergo during our tedious stay at this place. Our difficulties were increased subsequently to our arrival by the occurrence of unsettled weather, during which we had ample proofs that Bootan houses are not always water proof. We were besides incessantly annoyed with a profusion of rats, bugs and fleas, nor was there a single thing to counterbalance all these inconveniences, and we consequently left the place without the shadow of a feeling of regret.

March 24th To Ichinjee. We commenced by ascending until we had surmounted a ridge about 800 feet above Taseeling, during the remainder of the march we traversed undulating ground at nearly the same altitude, at first through an open country afterwards through beautiful oak and magnolia woods until we came on the torrent above which we had been ascending since leaving the Mateesum, a little further on we came on the finest temple we had seen and situated in a most romantic spot. It stood on a fine patch of sward, in a gorge of the ravine, the sides of which were covered with beautiful cedar looking pines. The back ground was formed by lofty mountains covered with heavy snow. Following the river upwards for about a mile and a half, we reached Ichinjee, which is situated on the right bank of the torrent. The march was throughout beautiful particularly through the forest, which abounded in picturesque glades. No villages or cultivation were seen. Ichinjee is perhaps the prettiest place we saw in Bootan, our halting place stood on fine sward, well ornamented with (*Quercus seme carpiifolia*?) very picturesque oaks and two fine specimens of weeping cypress. The surrounding hills are low, either almost entirely bare or clothed with pines. The village is of ordinary size, and is the only one visible in any direction, its elevation is 786 feet. There is some cultivation about it, chiefly of barley, mixed with radishes.

March 27th We continued following the river upwards, the path

running generally at a small height above its bed. Having crossed it by a rude wooden bridge, we diverged up a tributary stream, until we reached a small village, we thence continued ascending over easy grassy slopes, here and there prettily wooded, until we reached the base of the chief ascent, which is not steep, but long, the path running along the margin of a rhododendron and juniper wood. The height of its summit is 10,873 feet. Thence to Rydang was an uninterrupted and steep descent, the path traversing very beautiful woods of rhododendrons, oaks, yews, &c. Snow was still seen lingering in sheltered places above 10,000 feet. The march throughout was beautiful. In the higher elevations the *Bogh Pat* was very common. Besides the village mentioned, two temporary ones were seen near the base of the great ascent, built for the accommodation of the Yaks and their herdsmen. Of this curious animal two herds were seen at some distance.

March 28th We descended directly to the river Gnee, which drains the ravine, and continued down it sometime crossing it once, then diverging up a small nullah we commenced an ascent, which did not cease until we had reached an elevation of 8374 feet. Continuing for some time at this elevation we traversed picturesque oak and rhododendron woods, with occasionally swardy spots, subsequently descending for a long time until we reached Santagong, in the direction of which the trees became stunted, and the country presented a barren aspect. Santagong is 6300 feet above the sea, it is a small village, but the houses are better than ordinary. The surrounding country, especially to the north, is well cultivated and the villages numerous. The country is bare of trees, almost the only ones to be seen are some long leaved firs, a short distance below Santagong, close to a small pool abounding in water fowl.

March 29th From Santagong we proceeded to Phain, descending immediately to the stream, which runs nearly 1800 feet below our halting-place. Towards Phain the soil became of a deep red colour. This place, which is 5280 feet above the sea, is a small village, containing six or seven tolerable houses.

April 1st To Punukka. We descended rather gradually towards the Patchien, proceeding at first north-west, and then to the north. On reaching the stream, which is of considerable size, we followed it up, chiefly along its banks, until we arrived at the capital, no view of which is obtained until it is approached very closely. The valley of the Patchien was throughout the march very narrow, there was a good deal of miserable wheat cultivation in it, and some villages, all of moderate size. The country continued extremely bare.

The distance was about eleven miles. Punukka, the second capital in Bootan the summer residence of a long line of unconquered monarchs—Punukka, to which place we had been so long looking forward with feelings of delight although the experience of Tongsa ought to have taught us better, disappointed all of us dreadfully for in the first place I saw a miserable village promising little comfort as respects accommodation, and one glance at the surrounding country satisfied me that little was to be done in any branch of natural history for a narrow, unfruitful valley hemmed in by barren hills, on which no arboreous vegetation was to be seen, except at considerable elevation gave no great promise of botanical success. The capital of Bootan is for pre-eminence, miserable. The city itself consists of some twelve or fifteen houses, half of which are on the left bank of the river, and two-thirds of which are completely ruinous, and the best of these '*Capital*' houses were far worse than those at Phain or Santagong &c. Around the city, and within a distance of a quarter of a mile, three or four other villages occur, all bearing the stamp of poverty and the marks of oppression. The palace is situated on a flat tongue of land formed by the confluence of the Matchien and Patchien rivers. To the west it is quite close to the west boundary of the valley, the rivers alone intervening. It is a very large building but too uniform and too heavy to be imposing; it is upwards of 200 yards in length, by perhaps 80 in breadth. Its regal nature is attested by the central tower, and the several coppered roofs of this. The only cheering objects visible in this capital are the glorious Himalayas to the north, and a Gylong village 1200 or 1500 feet above the palace to the west elsewhere all is dreary desolate-looking and hot. During the first few days of our stay, and indeed until our interview with the Deb we were much annoyed by the intruding impertinence and blind obstinacy of his followers. They were continually causing disputes either with the sentries or our immediate followers, and it was only by repeated messages to the palace, stating the probable consequence of such a system of annoyance, that Capt Pemberton succeeded in obtaining any respite. After many delays, we were admitted to the Deb's presence on the 9th. A day or two after, our interview with the Dhurma took place. He received us in an upper room of the quadrangular central tower while we were in his presence we remained standing in compliment to his religious character. The Dhurma Rajah is a boy of eight or ten years old, and good looking, particularly when the looks of his father, the Tungso Pillo are taken into consideration. He sat in a small recess, lighted chiefly with lamps, and was prompted by a very vene-

rable looking, grey-headed priest. He had fewer attendants, and his room was less richly ornamented than that of the Deb. Around the room sat priests busily employed in muttering charmed sentences from handsome gilt-lettered black books, which reminded me of those used in some parts of Burmah. During our protracted stay at this place nothing particularly worthy of notice occurred. Intrigues seemed to be constantly going on and the trial of temper on the part of Captain Pemberton must have been very great. It was however soon evident that no business could be transacted with the Bootea Government without being enabled first to enforce abundance of fear, and consequently any amount of agreement from them. Messages to and fro passed continually the bearer being a very great rascal, in the shape of the Deb's Bengal Mohurrer. Thus he would come and appoint the next day for a meeting then he would return and say that such a place was better than such a place. As evening drew near, he would come and say, unless you agree to such and such, there will be no meeting and after bearing a message that no change in this respect would be made he would make his appearance and say, all the ministers were sick, and so could not meet. My only amusement out of doors was a morning walk up or down the valley. I was prompted to this chiefly by the pangs of hunger, as the Bootea supplies were very short indeed wild pigeons afforded me at least some relief. During the day I examined such objects as my collectors brought in, for it was too hot to think of being out after 9 A.M. The climate of Punukka has but little to recommend it and in fact nothing, if viewed in comparison with the other places we had seen in Bootan. The greatest annoyance existed in the powerful winds blowing constantly throughout the day up the valley, and which were often loaded with clouds of dust. The mean temperature of April may be considered as 71° . The maximum heat observed was 83° , the minimum 64° . The mean temperature of the first week of May was $75^{\circ} 3'$, the maximum 80° , and the minimum 70° . The cultivation in the valley the soil of which seems very poor, containing a large proportion of mica, was during our stay limited to wheat and buck-wheat, but scarcely any of the former seemed likely to come to ear. Ground was preparing for the reception of rice, which is sown and planted in the usual manner. Crops just sown are immediately eaten up by the swarms of sacred pigeons that reside in the palace, so that husbandry is by no means profitable, more especially as there are other means of providing for the crops, such as they may be. Thus we saw several small fields, amounting perhaps to an acre in extent, cut down to provide fodder for some ponies that

had lately shared in a religious excursion to Wandipore. Cattle are not frequent. There were some pigs. The fowls were of the most miserable description, and very scarce. In spite of offers of purchase and plenty of promises we were throughout allowed three a day, and they were rather smaller than pigeons. Towards the latter end of our stay rice became bad and scarce. There are a great number of Assamese slaves about Punukka; indeed, all the agricultural work, as well as that of beasts of burden, appears to devolve upon these unfortunate creatures, who are miserably provided for, and perhaps dirtier than a genuine Bootea himself. On the 9th May at noon we left Punukka, the most uninviting place I have ever seen in a hilly country. On the morning of the same day there was a demonstration in the palace of great boldness, the roof of the northern side was covered with troops, who shouted, fired, and waved banners. We crossed both bridges of the palace without any interruption or annoyance at which I was most agreeably surprised, and then gradually ascended the right flank of the valley, following the course of the united rivers Patchien and Matchien. We proceeded in this direction for some time until we came on a ravine affording an outlet to a tributary of the Punukka river, which we then followed gradually descending through fir woods until we reached the torrent. Crossing this, which is a small one, we commenced the ascent to Feligong, which we soon reached.

[To be continued]

BIBLIOGRAPHICAL NOTICES

A Report on the Progress of Vegetable Physiology during the year 1837. By F. J. F. Meyen, M.D., Professor of Botany in the University of Berlin. Translated from the German, by William Francis A. L. S. London, 1839. 8vo pp. 158.

To those who are interested in the cultivation of science it might appear superfluous to recommend such a work as this, and yet the delay in its appearance caused by the want of a sufficient number of subscribers at its very moderate price to cover the mere expenses of publication seems to indicate that it is not sufficiently known or appreciated. No one can now assume any elevated position in botanical science who is not conversant with the structure and physiology of plants, as well as with their external forms and aspects. The time when the acquirements of a naturalist were measured by the number of species he had collected is now, we trust, gone by for ever, and *names* and *classifications* are looked upon by the man of

enlightened views as but the *mechanism* by which the true principles of science are to be worked out. Although Britain can boast of possessing some among the foremost in the rank of philosophical botanists, and of having contributed her full share of the most important discoveries of recent times she must be content to remain far behind in regard to general knowledge of the science as long as the prevailing ignorance of its progress abroad shall continue to exist. To this our insular situation in part contributes, and it is partly due to the small amount of attention paid to natural history as a branch of general education. On both these points, however we look for rapid improvement. Rail roads and steam-boats will have an important influence on the progress of science as well as on the extension of commerce. The period is surely now commencing when "many shall run to and fro, and knowledge shall be increased." And in regard to education we see many indications of an important change. There is a growing feeling amongst those who are engaged in it that the minds of the young may be trained with advantage to observe and reason upon the wondrous phenomena of the universe—that to neglect the pages in which the *works* of the Creator are displayed to us is an error comparable with that of neglecting his *word*—and that, for the object of intellectual discipline the study of *things* may often be substituted for that of *words* with the double advantage of interesting the pupil, and of giving him a store of knowledge which will be subsequently valuable. To this revolutionary innovation upon the old system the University of London has given its sanction, by requiring from candidates for its degree in Arts a knowledge not only of classics and mathematics, but of natural philosophy chemistry natural history, and physiology. In this we see much that augurs well for the progress of science in England. The youthful mind is much more apt in the acquirement of elementary knowledge than the adult, whose observing powers have been allowed to lie dormant at the time of their greatest activity, and if a good foundation be early laid, we have no fear of a deficiency of motives for subsequent labour.

We have always regarded the study of Vegetable Physiology as the department of natural history best adapted to engage the attention of the young, from the facilities which offer themselves to its pursuit, and its freedom from those drawbacks so common in other branches. Its objects are never out of reach, for barren indeed must be that country which affords no shelter to the products of the vegetable kingdom. The meanest and most common herbs are in the eye of the physiologist as interesting as the majestic tree or the

rarest flower,—witness the important results obtained by Mirbel from the study of the *Marchantia polymorpha*. The toilsome labours of the collector are not required here, nor is the mind fatigued by the difficulties and technicalities of classification, and what renders the pursuit of this science especially adapted to the female sex is its freedom from the necessity of that corporeal suffering which however laudable its ultimate object the truly humane mind will always dread to inflict upon its sentient fellow beings.

There is another class upon which we would urge the necessity of attention to Vegetable Physiology—the students of medicine. Those who are sufficiently enlightened to perceive that a knowledge of the actions of the human body in health is the best preparation they can have for the study of its diseased conditions, will find it much to their advantage to have gained an early acquaintance with the vital phenomena exhibited by plants which often exhibit changes whose conditions are obscure in animals in a magnified form as it were and in circumstances which allow them to be more easily studied. We especially refer to those concerned in reproduction and in the act of organization on which new and important contributions have been recently made to vegetable physiology, that have led to equally successful researches into the corresponding mysteries of animal life. No one, it seems to us can now be esteemed a scientific physiologist who does not embrace in the scope of his inquiries all classes of animated beings, and the more extended his basis the more certain and comprehensive will be his generalizations.

Periodical reports of the progress of any special department of science are, if well executed, among the most valuable additions to its literature and this is particularly the case when the number of its cultivators is great so that their contributions are spread over a wide surface. There is perhaps no science which stands more in need of such comprehensive sketches than Vegetable Physiology, and no individual who could execute them with more success than Prof. Meyen. Of the mass of information brought together in the Report before us, a great part would never have reached this country if it had not been thus embodied, and if it be thought that he has manifested less acquaintance with the progress of science in England than with the labours of German physiologists it will be remembered that the fullness with which the latter are presented should make it peculiarly acceptable to the English reader, who may be supposed to be acquainted with the labours of his countrymen. The translation is very ably executed and presents the ideas of the author with greater force and precision than most of our readers would

be likely to attain by their own perusal of the original, since it requires considerable familiarity with the German language to be able to render with accuracy the nicer shades of meaning which are often adopted from colloquialisms into scientific language. We would strongly urge upon our scientific friends therefore to encourage the continued translation of these valuable reports by aiding in the sale of the part before us. We feel confident that they will progressively increase in interest as the science advances towards perfection, and will afford a valuable and interesting record of its progress. To those who desire to be *au courant* with the present state of knowledge an acquaintance with them is indispensable.

A List of the Genera of Birds with an indication of the Typical Species of each Genus. By George Robert Gray, Ornithological Assistant Zool. Departm. British Museum, &c, &c. 8vo. London, 1840.

This work, as its title indicates, contains a complete enumeration of the genera of birds disposed according to a system based on the arrangements of M. Cuvier and Mr. Vigors, with such improvements as in the author's view of the subject could be gleaned from those of Mr. Swainson and others. The number of genera enumerated, not including those names which are regarded as merely synonymous, amounts to 1065, but Mr. G. Gray avows his opinion that his List "contains some genera established upon characters too trivial to admit of their being definitively adopted." He states it indeed to have been his object in the present publication rather to give "a correct view of all the genera that have been proposed" than "closely to criticize the value of the subdivisions employed." We trust however that the latter more important task will be undertaken by him in a more extended work, in which the preface gives us reason to believe that he has long been engaged, viz. a 'Genera of Birds' accompanied with their characters.

In the mean time the work before us may be regarded as a useful outline of the present state of Systematic Ornithology, comprehending a much more complete enumeration of genera than any that has preceded it, evincing great care in determining the priority of names and showing due respect for that universal law (so recklessly infringed by many ornithologists) which scrupulously assigns the preference to prior publication. Under each genus are added the synonyms or those names which have been employed to designate species of the group, one species is cited as an example, a figure being referred to whenever it exists, and occasional rectifications of syno-

nymy occur with regard to the species mentioned By these means the work is rendered highly useful to the ornithological student, and especially to those who are desirous of obtaining an index to the extensive subdivisions that have been made within the last few years in this interesting department of zoology, through which the number of genera has been so largely increased It bears every appearance of having been compiled and arranged with industry diligence and good faith

PROCEEDINGS OF LEARNED SOCIETIES

ZOOLOGICAL SOCIETY

Aug 13, 1839 — William Yarrell, Esq, Vice President, in the Chair

A collection of Bird skins, from the neighbourhood of Erzeroom, presented to the Society by E D Dickson, and H J Ross, Esqrs was exhibited

The species contained in this collection were brought under the notice of the Meeting by Mr Fraser and the following notes (made by Messrs Dickson and Ross) which accompanied them, were read

Buteo ——— ? August 20† Very common arrives middle of March, and leaves middle of November

* *Falco tinnunculus* Linn M† April 28 Common Iris dark hazel A mouse found in its stomach This bird was perched on a tree with some starlings and sparrows

Falco tinnunculus Linn F April 29 A bird and a frog found in its stomach Five well-developed eggs in the ovarium Another had eight eggs besides a great many small ones and its stomach contained a frog and some scaly substances probably a portion of a fish It breeds in April on lofty poplars, and also on the top of mountains Arrives early in April and departs late in November

Falco Asalon, Temm M April 23 Eyes large, round, and of a bluish-black colour rim of eyelids, cere and legs, bright yellow A great number of thin tough worms, from one to two inches long between the peritoneum and muscles on the left side neither stomach nor intestines contained any

Milvus ater Gould M May 10 Common Shot on a tree close to the town Eyes large of a light cinnamon colour, and with a black ring round the iris Testicles reniform, yellow Arrives middle of March

Noctua Indica, Franklin August 1 Common about the foot of the mountains near the town

† The date when the specimen was procured

* The species marked with an asterisk have been noticed in the Proceedings as inhabitants of Irebizond, a locality not far distant from Erzeroom See Proceedings for 1834, pp 50 & 133, for 1835, p 90, and for 1837, p 126

‡ The letter M stands for male, and F for female, throughout the paper

- Cypselus murarius*, Ill M May 24 Very abundant Arrives beginning of May, leaves late in September
- Merops Apiaster*, Linn F May 20 Gizzard full of insects Arrives middle of May, leaves latter end of September
- **Coracias garrulus*, Linn September 6 Common in various localities Arrives early, and departs late in September
- Collurio minor*, Vig August 6 Common Frequents haycocks Arrives beginning of August, leaves middle of September
- Oriolus galbula*, Linn F September 2 Rather rare Found in willow-trees Arrives early in August and departs middle of September
- **Cinclus aquaticus*, Bechst F December 9 Very few seen Frequenting a mountain stream Shy flies rather high food, small crustacea Eyes light hazel Two small oval appendages, one on each side of the rectum, hollow, and communicating with its cavity The down on the breast very thick
- Motacilla alba*, Linn Not uncommon Arrives end of September and departs end of October Migratory
- Budytes melanocephala* Sav M June 7 Very common on moist ground food, insects Arrives middle of April and leaves early in November
- Phenicura ruficilla* Swains M April 29 A straggler found in a garden in Erzeiboom
- **Saxicola Oenanthe* Bechst Eyes hazel Frequents rills also found on adjacent hills
- Saxicola Oenanthe* Bechst M May 27 Common all over the neighbourhood Food, coleopterous insects and caterpillars
- Saxicola rubetra* Bechst A few seen in April
- **Erythraea rubecula* Swains (In spirit) Found in a stony ravine in November, the only one yet noticed
- Sylvia hippolais* Penn August 15 A few seen on high thistles in moist situations from the commencement of April to the middle of October Migratory
- Salicaria Cetti* ? Gould October 28 Caught in a stable after the first falls of snow Neither this bird nor several others of the same family procured at the time had any tails
- Anthus arboreus*, Bechst
- Anthus rufescens* Temm F June 2 Found on the adjacent hills Gizzard filled with coleopterous insects
- Alauda Calandra* Pall Rather numerous frequents fields Arrives end of October and departs late in September Migratory
- Alauda arvensis*, Linn Very common in summer
- **Alauda* ——— ? Not very common Food, the grain found among horses' dung This variety differs from the preceding species in the construction of the bill It is only found in winter, and occurs in flocks, in company with the Horned Lark (*Alauda penicillata*)
- Alauda brachydactyla*, Temm Seen in large flocks Only noticed from 21st of April to 28th of May Frequents fields and the hills The cock is of a brighter colour than the hen, and has its ears and the spot on the breast much darker

Alauda penicillata Gould† Numerous food, seeds The specimens sent are not so bright as the living bird, probably from the effects of the arsenical soap The males differ from the females in being of a brighter colour, and in having the black feathers on the top of the head much more distinctly marked The yellow gorget of both in winter is bright, and in summer remarkably faint while the purple on the nape is *vice versa* During the hot months they are found on the neighbouring mountains from which they are driven down to the plain in winter in quest of food, which consists then of the grain found in the dung of cattle the ground being at that time covered with snow several feet in depth They fly in companies of from three to twelve birds are very familiar especially so in winter, when they may be killed easily with an ordinary whip When approached or in the agonies of death they erect their horn-shaped crest quite perpendicularly with the tips curved inwards They run on the snow with surprising rapidity as soon as the snow has melted on the plain they return to the mountains

**Emberiza miliaria* Linn M & F April 23 June 5 Common in the fields close to Fizeroom Feed on corn

**Pyrgita domestica* Cuv M Excessively common Begin to pair and build about the end of April and beginning of May

Pyrgita petronia, Gould M May 28 Very common observed in the spring and summer months in steep and stony ravines Gizzard filled with wheat and chaff

Fringilla nivalis? Linn May 27 Rare food, insects Found in the neighbouring hills

Linaria montana, Ray October 14 Noticed from the 20th of September to the 18th of November in companies

Fringilla sanguinea Gould‡ May 28 Tolerably common First appears on the neighbouring hills and afterwards in the plains, at no great distance from them Food, the unripe seeds of the *Cichoraceæ* The young bird has a lighter plumage and its skin is of a deep pink colour Arrives in the middle of May, and departs in the middle of September

Pterocles arenarius Temm M & F Very common Iris dark hazel margin of eyelids pale light yellow Food grain vetches tares &c Said to breed towards the end of April on the adjoining hills, amongst loose stones Arrives in the beginning of April, they are then seen in those fields that are free from snow close to the town In summer frequents bare sterile grounds Quits Fizeroom about the end of September Native name *Bahghr Kahrah* (Black Belly)

**Otis tetrax* Linn Very common in ploughed fields and on the skirts of the marsh Arrives early in September and departs in the middle of November Native name, *Mez mel dek*

Glareola limbata, Rupp September 8 Rare In flocks in marshy situations

Vanellus cristatus Meyer September Very numerous Arrives

† Proceedings Zool Soc 1837, p 126

‡ *Ibid*

at the end of March and departs at the end of November During summer frequents the river†, but on its arrival and previous to its departure it is found in moist fields near Erzeroom Native name, *Kiz Cooshóo* (Maiden's Bird), or *Kahmaum-Cooshóo* (Bath-bird)

Vanellus Keptuschka, Temm September 17 A few observed from the middle of September to the middle of October In flocks This specimen sent had its right leg shrivelled up

Charadrius morinellus, Linn

Charadrius minor, Meyer June 26 Numerous on the sandy and pebbly banks of the Aras at Hassan-Kalch (18 miles east of Erzeroom), about the middle of June The naked rim round the eye is of a deep sulphur colour None of these birds have been noticed at Erzeroom

Tringa subarquata, Temm Numerous about the streams at So-ook-Tchermch, a village four miles from Erzeroom

Tringa minuta, Leisl August Plentiful at Tchif-lik a village five miles distant, close to the houses, about pools, in company with sparrows and starlings

Tringa minuta Leisl September 15 Abundant at the village of So-ook-Tchermch

Limosa melanura, Leisl November 15 One leg had apparently wasted and dropped off and the other was found in an incipient state of atrophy, like that in *Vanellus Keptuschka* Temm but not in so great a degree

**Himantopus melanopterus*, Meyer End of July Not very common On the borders of the river A naked rim round the eyelid, of a bright vermilion colour

Ardea alba Linn Not many seen only at the river, from the commencement of May till the beginning of October Sometimes in flocks and sometimes solitary

Ibis Falcinellus Temm End of August Seen during the hot months at the river

Ibis ——— ? End of August Not uncommon about the river in August Food, shell fish has a remarkably thick gizzard

Fulca ater Linn

Tadorna rutila, Steph August 30 Very abundant gregarious During the day frequents marshes, but feeds late in the evening and early in the morning in corn and stubble-fields Arrives in the middle of March and departs at the end of November rarely seen in the water Said to breed in the marshes Great numbers on the Lake of Van in August Native name, *Ahn-goót*

Sterna nigra, Linn Very common about the river during spring and summer

The collection also contains specimens of *Cricetus accedula* (*Mus accedula* of Pallas), which species is 'very common The eyes are large and black, cheek pouches spacious, extending from the angles of the mouth to the back of the head, a little beyond the ear It is

† The river referred to in this paper is the *Kai ah Soo*, or northern branch of the Euphrates

one of our domestic mice In winter it is sometimes found on the snow, its fur is then silky and glossy "

The common mouse (*Mus musculus*) is said to be very common in houses at Erzerum

The Spalax (*Spalax typhlus*, Illig), a specimen of which is also sent is said to be ' common all over the plain Its food is roots, but it will readily eat bread its paws are thick and fleshy it is very expert in burrowing which it performs with all four of its feet The pericardium is excessively thin and transparent, and without any traces of fibrous texture The left lung is entire and the right one divided into four lobes heart, pancreas and kidneys, natural, peritoneum of exactly the same structure and appearance as the pericardium liver five lobed with a small appendix a large thick, round blotch (resembling an ulcer) on the inner surface of the great curvature of the stomach, spleen narrow very much elongated, and adhering to the posterior and left side of the stomach, *capsula renales* firmly attached to the upper end of the kidneys, caecum and *appendix vermiformis* of an enormous size, in proportion to the intestines between the rectum and bladder a flat white substance of a follicular structure, and terminating at its posterior extremity in a thick fleshy canal Native name, *Kior Seetchun* (Blind Rat)"

MISCELLANEOUS

BOTANICAL INFORMATION

Unio Itineraria "

BELIEVING that many readers of the Annals of Natural History are unacquainted even with the existence of the Society whose notice is now about to be laid before them, it may not be amiss in the first place just to give a concise account of its simple organization and government before making known the Report of its present operations and progress, both the Report and the short account thereto prefixed have been translated and carefully abridged from the printed circular of the Society and from the file of correspondence received by their London agent from the Secretaries, Drs Steudel and Hochstetter the latter—the correspondence—comes down to the 20th March, 1840

Abstract from the laws of the Society —

" 1 The Wurtemberg Natural History Travelling Union, generally known among botanists as the 'Unio Itineraria,' consists in a society of the friends of natural history (especially botany), who at their general expense send out and support travellers and collectors of specimens illustrative of natural history, chiefly botanical in the

most interesting little known, and far distant parts of the world, under the superintendence of directors, secretaries &c

" 2 The introduction to this Society is open without limitation to amateurs and collectors generally, its only conditions are the subscribing a fixed sum for one or more shares (or even portion of shares) in each or any of the announced expeditions, such sum to be paid at the time of entering the application, &c

" 3 Each subscriber may bespeak either a larger or smaller share in the anticipated proceeds of any given enterprise as may suit his wishes or convenience, recollecting however that the most liberal and extensive supporters have the first claim for the most complete collections, &c

The above appears to give a sufficient intimation as to the general rules of the Society which however extend to seven principal enactments

Report of the present position of the Society and its enterprises — the latter now in progress, extend to three principal expeditions — viz —

First, That confided to Wilhelm Schimper into Abyssinia — Of this a portion of the dried plants is now being distributed into sets for the subscribers under the eye of the secretaries at Esslingen who report that the first delivery will (it is hoped) be ready in about two months time, this will include the plants collected up to the close of the year 1837 and contains *many* genera entirely new to European botanists and about *one-half* of the number of species will also it is believed prove new and undescribed. The seeds have already arrived and are by this time in the hands of the various subscribers in Europe they consist of small packets of 100 species, and some few sets are made up of 200 species

Second Kotschy's journey into Southern Nubia, Cordofan, Fasilak &c, is looked upon by botanists with scarcely less interest than the former one by Schimper into Abyssinia, embracing as it does a most extraordinary region, and one whose botany is at present almost entirely unknown, with the exception of some small previously obtained collections made by the same traveller a few years ago, and which being offered for sale at Vienna were eagerly purchased. Intelligence from Theodore Kotschy is now anxiously looked for as none has been received of a very recent date. That already possessed by the Society warrants them in earnestly inviting more subscribers to come forward and support this most deserving and courageous young man in an expedition of no ordinary interest and

importance, which indeed will form a continuation or supplement nearly allied to that of Schimper. It is in the full expectation of a part of Kotschy's collections being received at Esslingen from this traveller in the course of the present year that the directors of the Society feel themselves warranted in requesting new members to subscribe for shares from so low as 30 to 60 florins (3l 3s to 6l 6s sterling) or upwards according to the portion they may wish to secure. The subscription price is fixed at the same as Schimper's was viz 15 florins (1l 11s 6d sterling) per 100 species.

Third Welwitsch who has been despatched to the Azores and Cape de Verde islands and whose collections (including the plants he gathered during his detention at Lisbon and which are themselves far from inconsiderable) are shortly expected to arrive. A single share for this expedition is stated at 24 florins.

. The Society still have at disposal to Non subscribers a few collections from the former expeditions, viz Georgio Caucasian, North American and Egyptio Arabian, at from 15 to 25 florins per century.

9, Queen street, Soho-square London,
May 1st, 1840

NOTE ON *ARGULUS FOLIACEUS*, JURINE. BY WM THOMPSON,
VICE PRES NAT HIST SOC OF BELFAST

Belfast Oct 29, 1838.—In our market today I had the pleasure of detecting one of these very interesting and handsome parasites attached to the dorsal fin of a *Salmo Trutta*, about a foot in length. The *Argulus* is $3\frac{1}{2}$ lines long is a female, and in addition to the oval exhibits at the base of the tail the dark green spots (noirs, Desm Consid Gen Crust, p 332) which are considered to mark this sex. Although the fish to which it was attached had been for some hours out of the water the *Argulus* held so firmly by its two disks that I had some difficulty in detaching it without injury. For about ten minutes it was wrapped in a piece of dry paper and then placed in a vessel of water in which salt had been dissolved until it was to the taste like strong sea-water*. This was no sooner done, than my pretty captive after drawing her last pair of feet together several times†, thus calling to mind the common house

* This was done in consequence of my having been told that the fish was taken in the sea the stomach, however, contained the remains of fresh-water insects (according to my friend A H Haliday, Esq, to whose inspection they were submitted) which possibly might have been washed into the sea and there obtained, but this is by no means probable.

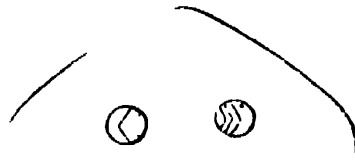
† I observed this repeatedly done afterwards—they seem to be rubbed against the caudal plates.

fly, struck out her oars, and thereby was rapidly impelled through the fluid

The figures of Desmarest (tab 50) and Yarrell (Brit Fish vol 11 p 399) are very characteristic of this species, but the great beauty exhibited in the specimen before me is at the same time not shown, perhaps in consequence of the upper side of the female not being represented—this consists in its being closely spotted with very dark green along the central part of the body for two thirds posteriorly commencing a little above the ovary in the form of a head and extending to the posterior portion, the rest of the upper side of the body being of a very pale yellowish green hue and semi transparent as described, the part thus spotted is well defined and is strikingly of the form of a coleopterous insect which the *Argulus* in another point of view resembles, when the two sides of the greenish transparent 'bouchiers' are thrown a little apart, as we see the elytra of the insect I was further reminded of the resemblance when attempting to remove it, as in holding firmly by the suckers, the body was drawn in and the 'bouchiers' elevated quite above it Its motion through the water seems equally rapid whether it be on the upper or under side, or swimming retrally—it frequently moved along the surface with its back downwards and was wholly immersed except the suckers, which were thrown either on a line with the water or quite above it and thus would the animal occasionally remain quiescent for a short period

The constant motion of these organs (visible to the naked eye) in addition to the rapid play of the feet, impart much life to the appearance of the *Argulus*, and present not the same aspect for two continuous seconds of time, whether the body be at rest or otherwise They—the marginal row of minute suckers, which appear as a dark line round the disk in figures of the species—are frequently drawn together to the centre of the disk, exhibiting a dark point not larger than the eye

The eye itself, under the lens or microscope exhibits constant motion, and even to our unassisted vision its red colour—that of the lady bird, *Coccinella septempunctata*—is apparent when magnified it looks black where the lines and dots are, red elsewhere



After having been about four or five hours in the salt water, and displaying its wonted activity to the last, the specimen was lost during my absence from the room I had intended to observe how long it—a freshwater species—would live in salt water, but though foiled

in this have thought these notes, made with the living animal before me, might perhaps be worth the room they occupy, more especially as the *Argulus* seems to be very little known as a British species. From what has been stated it would seem to be very tenacious of life. The individual here treated of is the second Irish one I have seen the other was, when swimming freely in Lough Neagh taken by Mr Hyndman in the autumn a few years since. Like the present specimen, it displayed a mass of large ova.

INFUSORIAL ANIMALCULES IN RED SNOW

Mr Shuttleworth relates that being occupied in the examination of some red snow that fell at the Grimsel and expecting to see only inanimate globules of *Protococcus nivalis* he was astonished to find that it was composed of organized bodies distinct in nature and form partly vegetable but the greater number endowed with the liveliest powers of motion and belonging to the animal kingdom. Among these he has named one species *Astasia* [Ehrenb.] *nivalis*, and another *Gyges sanguineus* — *Bibl Univ*

WEATHEROLOGICAL OBSERVATIONS FOR MARCH, 1840

Chiswick — March 1, 2 Cold and dry 3 Cloudy 4 Bleak and cold 5 Frosty cold and dry sharp frost at night 6, 7 Frosty haze fine 8 9 Clear and frosty fine 10 Very fine 11 Drizzly 12 Cloudy 13 Hazy fine 14 Overcast very fine 15 Slight rain 16 Fine but cold 17 Clear 18 Overcast 19, 20 Cloudy and cold clear 21 Very clear 22 Overcast 23 Fine but cold 24, 25 Clear and cold 26—28 Cloudy and cold 29, 30 Cloudy and fine 31 Drizzly

It may be observed that the quantity of rain in this month was less than 3-10ths of an inch. The barometer stood remarkably high and in general very steady.

Boston — March 1—3 Fine 4 Stormy 5—8 Fine 9 Cloudy 10 Fine 11, 12 Cloudy 13 Fine 14 Rain 15 Cloudy rain P M 16, 17 Cloudy 18 Rain rain P M 19, 20 Cloudy 21 Fine snow early A M 22 Cloudy rain P M 23 Cloudy snow early A M 24 Hail snow early A M 25 Fine snow early A M 26 Fine snow P M 27, 28 Cloudy 29 Cloudy rain P M 30, 31 Cloudy

Applegarth Manse Dumfries-shire — March 1, 2 Fine clear day frosty 3 The same getting cloudy P M 4, 5 The same still freezing 6 Remarkably fine day gentle frost 7—9 The same hoar frost A M 10 The same, but threatening change 11 The same, but cloudy no frost 12 The same continuing cloudy no frost 13 Dry and boisterous cloudy 14 Dry but cloudy 15 Fine day rain A M 16 Slight rain morning cleared up 17 Fine frosty early A M 18 Fine the same 19 Fine without frost 20 Fine hoar frost 21 Fine strong frost 22 Fine getting cloudy 23 Passing showers of snow and hail frosty 24, 25 The same very cold frosty 26 Fair but cloudy 27 Fine but dull 28 Remarkably fine day 29 The same after a shower A M 30 Wet morning drizzly all day 31 Occasional showers

Sun shone out 29 days Rain fell 5 days Snow and hail 1 day Frost and hoar frost 17 days

Wind north $1\frac{1}{2}$ day North-east $8\frac{1}{2}$ days East 2 days South 4 days South-west 3 days West 2 days North west 6 days. North-north-west 1 day North-north-east 1 day Variable 2 days

Calm 15 days Moderate 9 days Brisk 5 days Strong breeze 2 days

Meteorological Observations made at the Apartments of the Royal Society by the Assistant Secretary, Mr ROBERTSON, by Mr THOMPSON at the Garden of the Horticultural Society at Chiswick, near London, by Mr VELL at Boston, and by Mr DUNBAR at Applegarth Manse, Dumfriesshire

Days of Month 1840 March	Barometer					Thermometer										Wind					Rain			Dew point. Lond. Roy Soc. 9 a.m.
	Lond. Roy Soc. 9 a.m.	Chiswick		Boston 8 1/2 a.m.	Dumfries-shire 9 a.m. 8 1/2 p.m.	Lond. Fahr 9 a.m.	Roy Soc. Self register Max Min	Chiswick		Dumfries-shire Max Min	Lond. Roy Soc. 9 a.m.	Chiswick	Dumfries-shire Max Min	Lond. Roy Soc. 9 a.m.	Chiswick	Dumfries-shire Max Min	Lond. Roy Soc. 9 a.m.	Chiswick	Dumfries-shire Max Min	Lond. Roy Soc. 9 a.m.	Chiswick	Dumfries-shire Max Min		
		Max	Min					Max	Min														Max	
1	30.374	30.422	30.399	30.12	30.42	30.45	32.7	33.2	30.7	39	29	35	33	26	ENE	NE	E	E	E	ENE			28	
2	30.438	30.503	30.459	30.20	30.51	30.52	36.8	37.4	31.2	45	32	37	33	27	NE	E	E	E	E	ENE			25	
3	30.430	30.481	30.408	30.12	30.51	30.53	38.8	39.6	35.0	48	30	41	39	28	N	NE	calm	calm	calm	ENE			32	
4	30.386	30.425	30.382	30.10	30.50	30.45	35.8	36.3	32.8	48	24	37	41	30.4	NE	NE	E	E	E	ENE			30	
5	30.408	30.538	30.413	30.10	30.38	30.33	35.4	36.0	32.6	50	19	57	46	28	E	E	calm	calm	calm	ENE			29	
6	30.454	30.570	30.479	30.06	30.36	30.38	36.7	37.2	32.0	53	20	37	50	30.4	ENE	E	calm	calm	calm	ENE			30	
7	30.564	30.664	30.580	30.20	30.45	30.53	37.2	37.8	32.7	52	21	35	50	27.4	N	E	calm	calm	calm	ENE	0.00		32	
8	30.656	30.726	30.683	30.27	30.57	30.59	37.7	39.0	32.7	54	20	33	49	26.4	N	E	calm	calm	calm	ENE			30	
9	30.640	30.676	30.593	30.24	30.59	30.49	37.2	38.0	31.7	56	25	33	58	27.4	N	NE	calm	calm	calm	ENE			30	
10	30.392	30.430	30.322	29.95	30.35	30.32	39.0	47.4	35.3	56	41	37	53	29.4	NNW	N	calm	calm	calm	ENE			31	
11	30.284	30.369	30.301	29.88	30.32	30.30	42.8	53.7	38.6	46	34	43	49	40.4	N	NE	E	calm	calm	ENE	01		33	
12	30.274	30.295	30.244	29.82	30.20	30.10	43.8	46.3	40.8	51	20	42	49.4	35	NNW	N	calm	calm	calm	ENE			49	
13	30.106	30.143	30.050	29.62	29.97	29.95	45.0	46.0	40.7	53	39	43	47.4	42	NNW	NW	calm	calm	calm	ENE			38	
14	30.050	30.069	30.060	29.59	29.94	29.93	45.8	46.5	42.0	49	35	43	52	39	W	NW	calm	calm	calm	ENE			30	
15	29.974	29.994	29.844	29.48	29.70	29.82	43.2	43.8	40.4	48	38	43	52	40	W	NW	calm	calm	calm	ENE			38	
16	30.042	30.283	30.019	29.65	30.10	30.28	42.4	43.0	42.0	42	35	42	54.4	38	NE	E	calm	calm	calm	ENE	133		39	
17	30.282	30.300	30.279	29.90	30.26	30.26	39.8	40.6	37.3	47	39	45	50	29	NNW	N	calm	calm	calm	ENE			29	
18	30.174	30.218	30.143	29.75	30.20	30.20	41.7	45.7	39.2	46	39	45	50	29	NNW	N	calm	calm	calm	ENE			38	
19	30.198	30.333	30.202	29.83	30.23	30.25	41.3	42.0	40.0	49	29	42	49	38.4	N	NE	E	calm	calm	ENE			37	
20	30.318	30.399	30.319	29.87	30.27	30.37	41.3	41.8	36.4	52	29	42	48.4	30	NNW	NW	calm	calm	calm	ENE			37	
21	30.412	30.443	30.432	30.30	30.43	30.32	37.7	39.3	32.6	46	25	34	44	28	NW	N	calm	calm	calm	ENE			37	
22	30.310	30.346	30.154	29.86	30.16	30.00	39.7	40.6	32.0	50	34	40	46	36	NW	NW	calm	calm	calm	ENE			31	
23	29.998	30.202	30.032	29.60	30.12	30.25	39.0	46.4	37.4	50	30	37	43	30	NW	N	calm	calm	calm	ENE			33	
24	30.152	30.235	30.175	29.80	30.27	30.33	36.7	38.2	33.0	43	30	34	38	32	N	N	calm	calm	calm	ENE			37	
25	30.298	30.384	30.317	29.94	30.34	30.33	37.4	41.0	32.0	44	26	36	42.4	30.4	NNW	N	calm	calm	calm	ENE			32	
26	30.324	30.362	30.237	29.93	30.32	30.22	35.3	40.3	30.9	40	31	35	45	30	NW	NE	calm	calm	calm	ENE			29	
27	30.124	30.165	30.150	29.84	30.20	30.18	37.4	38.2	34.0	41	34	38	50	35	N	N	calm	calm	calm	ENE			30	
28	30.116	30.155	29.957	29.78	30.05	29.87	38.7	39.5	35.8	42	36	38	50	33.4	NW	N	calm	calm	calm	ENE			32	
29	29.788	29.858	29.827	29.40	29.67	29.66	39.5	42.0	38.2	50	34	42	55	36	W	W	calm	calm	calm	ENE			32	
30	29.894	29.930	29.892	29.36	29.73	29.70	46.7	48.3	38.2	54	43	44	44	42.4	S	S	calm	calm	calm	ENE			33	
31	29.840	29.866	29.823	29.43	29.61	29.55	46.8	47.6	45.2	47	42	47	49.4	40	NNW	W	calm	calm	calm	ENE			30	
Mean	30.248	30.315	30.231	29.86	30.217	30.208	39.7	41.7	35.9	44.8	31.35	39.0	46.7	32.7	Sum	0.28	70	0.15	Mean				33.5	



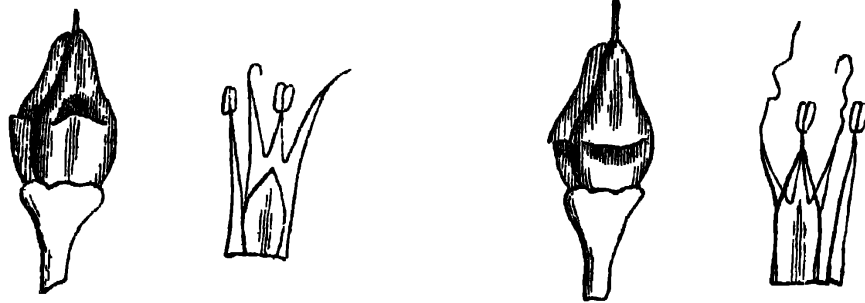
ANNALS OF NATURAL HISTORY.

XXXI — *On Allium Porrum and A Ampeloprasum* By
CHARLES C BABINGTON, M A , F L S , F G S , &c

IN my 'Primitiæ Floræ Sarnicæ,' p 95, I have mentioned the great difficulty which exists in distinguishing between *A Porrum* and *Ampeloprasum*, and am induced to communicate the following attempt at their discrimination to the 'Annals of Natural History,' in the hope that it may assist other botanists in determining the plants. Unfortunately the root is not usually to be found upon specimens of such large size as these leeks, for when that is present there can be no difficulty in distinguishing the species, the root of *A Porrum* (the true leek,) being formed of numerous concentric coats like that of an onion, producing no offsets whatever, and therefore its duration being not more than biennial, whilst that of *A Ampeloprasum* consists of a few concentric coats, including from two to four large offsets, and thereby somewhat resembling, in its transverse section, the bulb of a hyacinth, but having much larger offsets in proportion to the concentric coats. Happily the structure of the flowers, which at the first view appears similar in both plants, will supply us with excellent characters when examined with care. I have endeavoured in the wood cuts which accompany this short communication, to give some idea of the form of the germen, and of the form and proportions of the perigone and stamens in each plant. It will be seen that in both of them the germen is constricted at about the middle, but that in *A Porrum* the constricted part is continued upwards, and in *A Ampeloprasum* it is continued downwards, this is best seen at the time of flowering, as the enlargement of the fruit often nearly obliterates it, but will not be always found so strongly marked as in my figures. In the former the segments of the perigone are shorter than the common filament of the 3 pointed

stamen, and the anther-bearing point is only half the length of either the common filament or of the barren points, but in the latter the segments of the perigone are longer than the common filament, to which the anther-bearing point is equal, but at the same time only one-third of the length of the barren points

In Gaudin's Fl Helv v 11 t 11 the perigone of *A Ampeloprasum* is figured as longer than the stamens, and thus not at all agreeing with our plant, which more resembles his figure of *A rotundum*, t 10, in which he represents (and at p 482 describes) the stamens as longer than the perigone, differing in this from all other writers who have described *A rotundum*, quoting Clusius, Hist v 1 p 196 (for 190) for *A rotundum* instead of *A Ampeloprasum*, to which it is usually, and, as it appears to me, correctly referred, and omitting *A Ampeloprasum*, Wald and Kit t 82 which is generally considered as a good figure of *A rotundum*. He has not given a representation of the root of *A rotundum*, but those of *A Porrum* and *Ampeloprasum* are pretty characteristic. I am not satisfied with his figures of the fruit

1 *A Porrum*2 *A Ampeloprasum*

It is remarkable that all the writers to whom I have referred describe the heads of both these species as bearing capsules and not bulbs, for I find that some individuals of the former produce bulbs on the head, amongst the flowers, in cultivation, and that the same is the case with the latter in a wild state in Guernsey

I propose the following specific characters for these plants, both of which are distinguished from *A rotundum* by their exerted stamens

- 1 *A Porrum* (Linn) Caule ad medium folioso, foliis planis,

umbella globosa capsulifera bulbiferave, filamentis 3 interioribus 3-cuspidatis perigonio paulo longioribus, cuspidate antherifera filamentis ipso cuspidibusque sterilibus duplo brevioribus, bulbis simplicibus Pars superior germinis contracta et dorsum utriusque segmenti appendiculo transversali ascendente instructum

- 2 *Ampeloprassum* (Linn) Caule ad medium folioso, foliis planis, spatha elongata, umbella globosa capsulifera bulbiferave, filamentis 3 interioribus tricuspidatis perigonio paulo longioribus, cuspidate antherifera filamentum ipsum subæquante cuspidibus sterilibus triplo brevioribus, bulbo e bulbis paucis in tunica nidulantibus formato Pars inferior germinis contracta et dorsum utriusque segmenti appendiculo transversali descendente instructum

St John's Coll, Cambridge, Nov 1, 1839

XXXII — *Notice of some Fungi collected by C Darwin, Esq, during the Expedition of H M Ship Beagle* By the Rev M J BERKELEY, M A, F L S

[With Plates, No VIII and IX]

THE Fungi here noticed were placed in my hands some time since by Prof Henslow I am not certain whether they are all that were collected by Mr Darwin, though it is probable, from the great mass of other matter upon his hands, that such is the case Though the number is small, two of them at least are quite new, and the *Dædalea* is one of the most beautiful of its race

- 1 *Polyporus sanguineus*, Meyer (No 464).

Rio Janeiro May .

- 2 *Stilbum lateritium*, n s Gregarious, bursting from beneath the bark, solitary or subfasciculate, pale brick-red, stems about 1 line high, thickest at the base and dusky, often confluent and flattened, pruinose from the presence of short curved obtuse flocci. Capitula ovate or subhemispherical, minutely setulose Sporidia oblong

Rio Janeiro May With the last This is certainly very near to *Stilbum cinnabarinum*, Montagne, 'Ann'd Sc Nat.' n s vol viii p. 360, a species found in Cuba, of which I have

received a specimen accompanied by a sketch, from the learned author, who most liberally sent me half of the only specimen he possessed. The habit is very different. There is a variety of *St lateritium* from St Vincent's in Sir W J Hooker's collection with a smooth stem. A third species, *S aurantiacum*, approaching very near to either, has been lately discovered in Leicestershire by Churchill Babington, Esq. It is probable that at some future time it may be thought right to separate the three species from *Stilbum*. The structure of the capitula is distinctly filamentous, and the sporidia, in Mr Babington's plant at least, originate from the tips of the flocci.

3 *Thelephora lobata*, Kz Fr in Linnæa, (No 599)

Rio Janeiro May

4 *Polyporus pinsitus*, Fr El (No 599)

Rio Janeiro May

5 *Polyporus australis*, Fr (No 600)

Rio Janeiro June

6 *Polyporus versicolor*, Fr (No 1345)

Falkland Islands on the underside of timber Entirely resupinate

7 *Sporidesmium adscendens*, n s Flocci bent at the base and filiform, flexuous, above abruptly incrassated, apex attenuated, truncate. Forming elongated black patches on the pileus of *Polyporus versicolor*. Allied to *Sporidesmium hormiscioides*, but in that species the threads have no distinct thickened portion above as in the present species. The articulations contain a large globule.

With the last Falkland Islands

8 *Dædalea erubescens*, n s Cæspitose, confluent. Pileus $4\frac{1}{2}$ inches broad, coriaceous, depressed in the centre with the margin broadly deflexed, minutely velvety and silky, zoned, fulvous-cinnamon, nearly even, with the exception of one or two well-marked ridges, margin irregular, slightly fringed. Gills broad, unequal, distinct, rigid, much jagged, tinged with pink towards the margin, running down to the very base of the stem, on which they anastomose, and are clothed with a beautiful velvety pile. Stem central, 2 inches high, $\frac{1}{3}$ of an inch thick, solid, dilated upwards into the pileus, velvety marked with oblong reticulations from the decurrent gills,

fulvous-cinnamon, growing out of a thick spongy mycelium, which is attached to wood and leaves

It is matter of doubt whether this species should be placed in *Dædalea* or *Lentinus*, though the habit is rather that of the former genus. The gills are not the least sinuous, and do not anastomose at all above, their colour is nearly that of deep tinted specimens of *D. biennis*. The pileus resembles somewhat that of *Polyporus perennis*, and in young plants is probably infundibuliform. The sporidia appear to have fallen out entirely, as is in general the case with exotic Hymenomyces, and the cells of the surface of the hymenium have grown since the plant was gathered, so that the form of the sporophores (*basidia*, Decaisne) cannot be detected. This is frequently the case in the coriaceous fungi, and can only be prevented by very prompt drying, care being taken to place the specimen when laid to dry in its natural position. No number being attached to this species, I am not able to say where it was gathered, but probably at Rio Janeiro.

Two other species are in the same collection which I am unable to determine, one a byssoid production, of doubtful affinity, from Terra del Fuego, No 496, the other an imperfect *Thamnomycetes* (probably *T. chordalis*) from Rio Janeiro, No 575.

LXPLANATION OF PLATE VIII

- Fig 1 *a* *Sporidesmium adscendens* on resupinate *Polyporus versicolor*, natural size
b, c, d Filaments, more or less magnified
 Fig 2 *a* *Stilbum lateritium* on bark, natural size
b The same, magnified
c Two individuals more highly magnified
d Flocci, of which the capitula are composed
e Sporidia

PLATE IX *

Dædalea erubescens

Plate IX will be given next month in the Supplement Number

XXXIII — *Zoological Notices* By Dr A PHILIPPI* With
Plates III and IV

[Continued from p 96]

6 *Pandorina coruscans*, Scacchi Plate IV fig 1—4

SR ARCANGELO 'SCACCHI has described this remarkable genus in his 'Osservazioni Zoologiche,' p 14 (May 1833), in the following words "Testa bivalvi, transversim oblonga, alba, latere antico (1 e anali) productiore, truncato, hiante, postico (1 e orali) rotundato, valvis inæqualibus, fragilissimis, subpellucidis, intus margaritarum nitore coruscantibus, exterius ad ambitum tenuissimo epidermide obductis, longitudinaliter striatis, ad umbones læviusculis, striis transversis obsoletis, valva dextra (1 e sinistra) majore, umbone ac limbo superiore (1 e ventrali) sinistram superante, valva sinistra (1 e dextra, si animal incedens inspicitur) inferius ad latus anticum (1 e posticum) super dextram producta, membrana prætenui ad latera umbonum valvas revinciente, cardine edentulo, linea prominula obliqua pro ligamenti insertione, ligamento tantum interno oblongo, ultra pollicem lata, altitudine 5 lin" To this description I have only the following remarks to add The longitudinal striæ are extremely delicate, elevated, and every fourth is as it were beset with small points, which proceed from the epidermis The membrane, which unites posteriorly the dorsal margin of the shells, I would without hesitation call an *external ligament* An *area* and a *lunula* may be distinguished, which are rather sharply defined, and are smoother than the rest of the shell both are narrow and asymmetrical, the *lunula* is broader on the left shell, the *area* on the right The *muscular impressions* are tolerably near to the margin, the anterior one is longitudinally oval, the posterior one more quadrate and far nearer to the margin on the left shell than on the right, which corresponds to the line defining the *area* The *impression of the mantle* has a very slight incurvation, which forms nearly a right angle with the part of the shell parallel to its ventral margin This indicates two very short tubes, which the animal actually possesses The *hinge* is quite toothless, never-

* Translated from Wiegmann's 'Archiv, Part 2 1839 — The Plates will be given next month, in the Supplement

theless the margin projects directly before the vertex of the right shell in the form of a little tooth (see fig 3) The *cavity* for the ligament runs very obliquely backwards and is perfectly linear To my great surprise, I found in my three young specimens, instead of the ligament, a *bone*, as in *Osteodesma* and others, of an elongated nearly pentagonal form, with the apex directed anteriorly, the slightly hollowed basis posteriorly, and moderately gibbous on the ventral side*

The *animal* of *Pandorina* has, according to a drawing communicated to me by Sr Scacchi, two short slightly projecting siphons, with fringes at the margin, and a long compressed and narrow foot, the situation of which proves that at least a third part of the mantle anteriorly is split

I had found this shell in a fossil state in Sicily, and named it *Pandora? aequivalvis* in my 'Enumeratio Molluscorum Siciliae,' and I also noticed the resemblance and difference between it and *Pandora* as far as they were to be seen on the fossil specimens The principal differences in the shell are as follows 1 The right half is perfectly flat in *Pandora*, in *Pandorina* only a little less vaulted 2 *Pandora* has teeth on the hinge Lamarck's statement in 'Hist Nat des Animaux sans Vert' is not good, on the contrary, that of Deshayes in the second edition of the same work is excellent they consist, on the left shell, in a front tooth (which in those *Pandoræ* that I have at hand to compare is perfectly flat), and a deep cavity between it and the ligament, into which fits a tooth of the right flat shell In *Pandorina* every trace of a tooth has disappeared on the left shell, and on the right one only an exceedingly slight analogue to it exists in the projection of the margin 3 *Pandora* has quite simply an internal ligament I must however remark, that *Pandora* appears to me to possess also a second ligament, namely, immediately at the margin, fig 5 *a*, fig *b* is the usual one 4 *Pandora* has a perfectly simple muscular impression, whilst in *Pandorina* only a

* Sr Scacchi remarks, 'Enum, p 6 Note on *Thracia*, "in utraque specie reperimus ossiculum mobile ad cardinem, quum specimina juniora observavimus, at in adultioribus seu majoribus etiam cum mollusco perquisitis, illud nunquam invenimus Miramur sane ossiculum illud adolescente conchylio evanescere, sed sic observatio pluries repetita nos cogit opinari, neque inspectio testarum suspicari permittit, specimina majora diversas constituere species' May not this also be the case with *Pandorina*?

slight incurvation of the mantle can be recognised From this it appears that *Pandorina** is certainly the most nearly allied to *Pandora*, but on account of the internal bone of the ligament, the absence of teeth to the hinge, the gaping of the posterior side, this genus also joins on to *Thracia*, which (at present I can only compare *Thr phaseolina* or *Tellina papyracea*, Poli) is distinguished by a short external ligament resting on distinct nymphæ, by a far more decided incision beneath the apex and a deeper incurvation of the mantle, here too the left shell is the more convex, as in *Corbula*, not the right one, as in *Pandora* and *Pandorina* But *Pandorina* is distinguished from both these by the *longitudinal striæ*, which, as far as I am acquainted, do not occur in them or even in the whole family of the *Myæ* and *Corbulæ*

From this last circumstance, the complete absence of hinge teeth, the double ligament, the brittleness of the shell, and lastly from the thinness of the epidermis which covers the whole shell, *Pandorina* brings to mind the singular genus *Galeomma*, which is truly very different at first sight, from the equality of the shells and the wide gaping of the ventral side, as also from the existence of only one tube, or if we choose the second obliterated, as in *Solenomya*†, nevertheless, I believe that *Galeomma* is more nearly allied to this genus than to any other M Deshayes, who was only acquainted with the mere shell, classes it with *Glycymeris*, which genus however differs very considerably by its very thick epidermis, rather reminding us of *Solenomya*, its strong prominent nymphæ, its small foot, its slightly slit mantle, and the long thick cohering siphons.

There are at present therefore six genera with a little bone in the ligament *Anatina*, Lamarck, Desh, *Periploma*, Schum, *Osteodesma*, Desh, *Thracia*, Leach, *Pandorina*, Scacchi, which all belong to the family of the *Myacæ*, to which Deshayes with good reason unites the *Corbulacæ*; and *Cleidothærus*, Sow, which is allied to the *Chamæ*

* See note in the following article, p 305

† On the outside of *Solenomya* where we expect to find the anal tube, it presents a circle of papillæ, which is however *not* perforated, as is very accurately stated by Sr Scacchi This explains why M Deshayes has ascribed two siphons to the *Solenomya*, I on the contrary only one We both saw correctly, but not accurately enough.

PLATE IV *Fig 1 Pandorina coruscans*, Scac , a small specimen, lying upon the left, more strongly vaulted, shell

Fig 2 The same lying on the ventral side in order to show the *area* and *lunula*

Fig 3 The same opened and twice magnified

a The little bone in the ligament •

b The cavity into which the bone fits

c The external ligament

Fig 4 The animal of *Pandorina* after a drawing of Sr Scacchi

Fig 5 A shell of *Pandora rostrata* for comparison

a An external ligament ?

b The internal ligament

c The hinge tooth

7 On the Animal of *Astarte incrassata*, De la Jonk

Plate IV fig 6

I obtained two specimens of this rare animal which were still alive, but as they would not open their shells I was compelled to use force. The animal was therefore seen in a half contracted state. The mantle is almost entirely split. A narrow band separates posteriorly a small roundish aperture, which supplies the place of the anal and branchial tubes, as was to be expected from the analogy of the shell with that of the genus *Venus*. At the margin of this aperture, as well as at the margin of the hinder portion of the front aperture, the mantle is of a dark brown colour and beset with very delicate white filiform cirri. More anteriorly these cirri become smaller and take in some degree the shape of white folds. The *foot* is securiform, acute behind and in front, therefore constricted, and in this way distinctly separated from the mass of the intestines, it is of a scarlet red colour. The *branchiæ* are dissimilar, the interior one is nearly triangular, and exhibits a dorsal, a ventral, and a front side. It is connected by the dorsal side to the outer branchia, which is only about half the size, not projecting so far anteriorly, and is rounded where the inner one exhibits the strongly projecting angle. Both the branchiæ are fastened by their common apex to the narrow connexion of the two lobes of the mantle between its anterior and posterior aperture, yet so slightly, that they are easily separated. The *appendices buccales* are two in number on each side, small and oblong. •

Sr Scacchi observed this animal some years ago, and gave

a short description of it in his 'Osservazioni Zoologiche,' (No II May 1833, p 15) which are but little known His statements perfectly agree with my observations, with this one exception, that I cannot find the large reddish brown spot which he saw on the mantle in the region of the umbones I must also fully subscribe to his views upon the systematic classification of the animal which he adds to his description The description proves that the animal of *Astarte* has no resemblance to that of *Venus*, as was supposed from the constitution of the shell by Cuvier, 'Règne Animal,' edit 2 vol iii p 150, and Rang, 'Manuel de Malacol' p 314, and Deshayes in Lamarck, 'Hist. d. Anim. sans Vert.' edit 2 vol vi p 256, but on the contrary it quite agrees with *Cardita*

I cannot help remarking on this occasion, how frequently the laws of analogy which we expect to find between animal and shell fail in the Molluscs Whilst in the vertebrate animals, almost without exception, a similar osseous skeleton, and even some similar bones, necessarily belong to animals which are also similarly formed in their other systems, we find that in very many cases this is not so in the molluscs To quite similarly formed shells belong animals of decidedly different structure I only refer to *Vermetus* and *Serpula*, *Sigaretus* or *Coriocella*, and *Cryptostoma** and *Buccinum*, Lamk, where *B. undatum* is hardly distinguishable from *Fusus antiquus* by anything but its black spots, whilst *B. Linnæi* and *B. maculosum* agree with *Purpura*, *Columbella* and *Mitra*, and many other species, as *B. mutabile*, greatly differ from both mentioned forms, lastly, *Fusus* and *Pleurotoma* On the contrary, a very similar animal often inhabits very dissimilar shells I will mention for example *Achatina* and *Carocolla*, *Mitra* and *Purpura*, *Cerithium* and *Rostellaria pes pelecani*, *Cardita* and *Astarte*, &c

I have still one correction to add concerning the synonyms of *Astarte incrassata* I formerly added to this the *Venus Danmoniensis* and *V. sulcata* of English authors, but my friend M Koch has pointed out to me that the English species is decidedly distinct M Deshayes also in his second edition of Lamarck, represents the *Astarte incrassata* (*Venus incras-*

* See note in the following article, p 307

sata, Brocchi,) and *A. fusca* (*Tellina fusca*, Poli,) as two distinct species (p 257), but I must persist in my view, that they are identical. I have at this moment twelve perfect individuals before me, in which I find every transition, from a perfectly smooth shell, only obliquely grooved at the apices, to one which is covered as far as the margin with great regular grooves. Moreover, the shell is sometimes flat, sometimes strongly vaulted.

Fig 6 Astarte incrassata, de la Jonk. One and a half times magnified.
The upper mantle lobe is thrown back in some degree, in order to show the form of the foot and the two branchiæ.

8 On the Animal of *Pleurotoma Bertrandi*, Payson. Plate IV
fig 7

I have also now seen the living animals of two species of *Pleurotoma*, *Pl Bertrandi* was very frequent. That which greatly distinguishes the animals from *Fusus* is, that they are quite without operculum. The foot when stretched out is somewhat longer than the last whorl of the shell, rather narrow, truncated anteriorly, and slightly emarginate, with an oblique groove, narrowed gradually posteriorly, and at last emarginate. The branchial tube projects tolerably far out of the canal. The head is small, the tentacula are short, filiform and obtuse, thickened half-way up, where they carry the eyes externally, they do not unite in an acute angle, as is the case in *Fusus*, *Murex*, *Mitra*, but the head forms a slightly rounded projection, just such a one as is seen in the species of *Tritonium*. The colour is transparent, marbled with yellowish-white, sometimes with reddish-white opaque points upon the siphon. The other species, either *Pl gracile** or a new nearly allied species, is distinguished, with regard to the animal, from the present species solely by the foot being posteriorly acute, and the siphon being decidedly spotted with red.

Fig 7 Pleurotoma Bertrandi, Payson. Magnified four times.

9 On the Eggs of *Vermetus gigas*, Bivona. Plate IV fig 8

During October and November I found *Vermetus gigas* almost always with eggs in different stages of development. They are inclosed in oval, flatly compressed cases, which have

* This is *Murex attenuatus*, Mont Test Bit — J E G

at one end a point with an aperture, the membrane forming the envelope being contracted into a narrow chord. The less developed smaller cases are nearly 2''' long and 1''' broad, and contain about twenty to thirty yellow eggs, which appear to be kidney-shaped, when slightly magnified, but when more strongly magnified they already show 1 to 1½ whorls of a shell. The larger egg cases are nearly twice the size, and the embryos may be very plainly seen. We recognise a regular shell of two whorls wound to the right, and two black eyes behind, which have between them a blackish stripe, the intestinal canal, the aperture of the shell is extended beneath, as in *Proto*, DeFrance. I did not succeed in examining the embryo more accurately. The young shell did not dissolve in vinegar, and from this appears to be of a horny nature. In trying to lay bare the little animal by compression, it was completely crushed every time. -

Fig 8 Eggs of *Vermetus gigas*, Biv

- a A mass of eggs but little developed
- b One more developed, in which the embryos are already furnished with one whorl and a half of the shell, both of the natural size
- c An embryo strongly magnified, with two perfect whorls of the shell. The eyes and the alimentary canal are seen through

10 *Hersilia* apodiformis*, a new Genus of *Entomostraca*

Plate IV figs 9, 10, 11

On the second of November I found in some sea water two small Crustacea, which at first sight appeared to be similar to *Apus*, with a long tail and swimming about very briskly. A closer examination proved that they were two pairs in the act of coitus, which I was able to place under the microscope without their separating, one pair even held together after death, the tail was the male. They differed in colour, in one pair the female was perfectly transparent, the male on the contrary coloured with large purplish red moveable points, in the other pair it was the reverse, the female was so coloured and the male colourless. From this I suppose that the colour is only in consequence of the food taken.

* This name will require to be changed, having been used by Savigny for a genus of Spiders.

The female, without the tail bristles, is $\frac{2}{3}$ rds of a line long, and oval, the male not quite half so long, and narrower. The body was quite covered by a quadriarticulated *shield*, the first segment occupies nearly the half of its length, the last a fourth, the second and third each an eighth part, the first three segments have a point on each side at the end. On the first segment I saw in front two round points at a moderate distance from each other, which I am inclined to take for eyes. Under the shield anteriorly only the two great antennæ appear, posteriorly the tail and the extremities of the posterior legs. The antennæ are only two in number, inserted beneath the shield, near to the anterior margin. They attain to half the length of the body, and appear to consist of five articulations. The basal joint is very short, concealed beneath the shield, the second articulation is longest of all, then the fifth, the fourth is the shortest after the first. Perhaps the fifth consists of several articulations. I was however unable to assure myself of this. Anteriorly all these joints are ciliated with long stiff bristles, posteriorly there is only one bristle at the end of every joint. There are four pairs of distinct feet, one to each segment of the shield. The three first pairs are quite similarly formed, and consist of a biarticulated stalk, which bears two ramifications. The stalk has posteriorly a long bristle on the first joint, a shorter one on the front end of the second. The front ramification consists of three articulations, of which the third is as long as the two first together, it has upon its anterior side three strong bristles, and posteriorly five longer but weaker ones, whilst the two first articulations have only a short bristle at the anterior end. The hinder ramification is just as long and has also three articulations, but these are alike and densely beset with cilia on the posterior side. The fourth pair is simple, biarticulated, the first articulation is very short, the second rather long and armed with four bristles. The tail is about the third part of the whole length of the animal, but only half of it projects from beneath the shield. It is not distinctly articulated, tapering towards the end, and terminates in two obtuse small projections, each of which bears five long bristles. The inner bristles are the longest, in the male more than half as long as the body, in the female considerably

shorter In the tail on each side is the orifice for the female sexual apparatus

What I could observe of the *cibarian apparatus* is as follows Behind the tentacula are two diverging *mandibles*, which are of the form of an obtuse-angled quadrant, and upon the posterior side of the second joint it is beset with long and thick cilia Between their insertion is a triangular space with the apex directed posteriorly, perhaps the mouth Beneath the cilia, on each side, are three *maxillæ*, which terminate in a forked bristle, and consequently remotely remind us of the pincers of *Limulus* In both sexes between these parts and the first pair of feet is situated a *foot jaw* on each side It is nearly quadrate, and terminates at the anterior and inner angle in a long acute tooth on the front side it also carries a small appendage of a vesicular form, and exteriorly a biarticulated flagelliform palpus I could not distinctly recognise the sexual apparatus of the male from the minuteness of the animal Two large almost clavate organs which were inserted in the vulva of the female are situated on both sides of the mouth, besides which there are two antenniform setigerous organs, which take their origin close behind the true antennæ At first sight the animal reminds us of *Apus* by its great shield, but it is more nearly allied to *Cyclops* by its tail and the biramified legs It is still more nearly allied to the genus *Sapphirina* of Thomson, with which I am acquainted only from Lamarck's 'Hist Nat' (2nd edit &c vol v p 171), which also has a flat compressed shield-like body, biramified legs, and only two tentacula, but is distinguished from it by a shield of nine segments and four pairs of biramified legs The essential characters are briefly contained in the following description .
Corpus clypeo magno e segmentis quatuor formato obtectum
Antennæ duæ magnæ, filiformes, 5-articulatæ Pedum paria quatuor, tria pinna bifida, quartum simplex. Cauda apice bifida et setigera.

Fig 9 *Hersilia apodiformis*, mihl A female lying on its back Sixty times magnified

- e The eyes
- a The mandibulæ?
- b The maxillæ
- c The foot jaw with its biarticulated flagelliform palpus
- d The three pairs of biramified legs

e The pair of simple legs

f The vulva

Fig 10 The male in the act of coitus hanging to the tail of the female, magnified with the same power

g The posterior antennæ?

h The two penes

Fig 11 A female of *Hersilia apodiformis* Natural size

11 *Peltidium purpureum*, a new genus of *Entomostraca*

Plate IV fig^s 12 and 13

I have only one specimen of this little animal, which is scarcely $\frac{1}{2}'''$ in size. The body is expanded in a shield of seven segments, which in its general contour is ovate. The first segment is nearly as large as the following segments together, and has in some degree the form of a trapezium whose base is turned backwards, and is bounded by a concave line. Anteriorly it has a truncated protuberance, on which two small round points appear, and probably are the eyes. The following five segments are of a narrow crescent form, the last and smallest is again in the form of a trapezium. Behind this projects the very short two-pointed tail, each of its points is furnished with four bristles, of which the inner one is the longest. The antennæ are two in number, they proceed from the angles which the first segment forms with its appendage, attain nearly a third part of the length of the animal, and consist of six short articulations, the two last of which are very small. On the front side, and especially at the apex, they are provided with long bristles. I find six pairs of legs. The *first pair*, which appear to be inserted after the first segment, is simple, and seems to consist of three articulations only (*Fig* 13, *c*). The second articulation, somewhat thickened at its base, has a tooth towards the end of the hinder side, the third articulation is a narrow moderately curved claw. The following four pairs of feet are bibranchiated, and have this character in common, that the hinder or inner branch originates at a moderate distance from the apex of the stalk. (See *fig* 13. *d, e, f*) Both the outer and inner branches of the *second pair* have two articulations, and the first branch is twice as long as the second. Its second articulation is the longest, and ends with three short bristles, two of which are bent in the form of a hook (*d*). The *third pair* (*e*) is distinguished from the two following

by its inner branch being triarticulated, whilst the latter have only two joints. The outward branch is in them also triarticulated, the first and second have at the end in front a thick bristle, and posteriorly a similar one in the centre, the last joint, which is twice as long as the preceding, has in front four short strong bristles, and behind five longer weaker bristles. The *last pair of feet* is again simple, biarticulated? the last joint longish, slightly curved, and has three spines exteriorly, four at the apex, and one behind (*g*). From the small size of the animal, and as I had only one specimen, I could but very imperfectly distinguish the cibarian apparatus. Nevertheless I plainly saw, in the first place, behind the antennæ, a *mandible*, consisting of two linear joints of equal length and breadth, the first of which bears posteriorly in the centre a four-branched bristle, and the last one several simple bristles at the end (see fig 13 *a*), manifestly the same organ which appears in a slightly differing form in *Hersilia*, in the second place, a *foot jaw* likewise consisting of two equally long joints, the second of these is very narrow, and bears at the apex a short unguis or some very short bristles (*b*).

The colour of the animal was a dark purplish-red, the antennæ, tail, and legs pale red, the fore margin of the cephalic appendage colourless.

This genus stands between *Hersilia* and *Supphirina*, and is distinguished from both of them by the different number of thoracic segments and of the feet, as well as by the structure of the first pair of feet. It may be thus briefly characterized: Corpus clypeo magno, e segmentis septem formato obtectum, segmento primo maximo. Antennæ duæ magnæ sexarticulatæ. Pedum paria sex, par primum simplex, ungue longo terminatum, paria secundum, tertium, quartum et quintum ramos duos gerentia, par sextum simplex. Cauda apice bifida et setigera.*

Fig 12 *Peltidum purpureum* mihi, natural size

Fig 13 The same lying on its belly, magnified sixty times

a The mandibles *

b The foot jaw?

c A foot of the first pair

d A foot of the second, *e* of the third, *f* of the fourth or fifth, *g* of the sixth pair

XXXIV —Notes on Dr Philippi's Zoological Notices in the
preceding Article By J E GRAY, Esq

Pileopsis Garnoti, Payraudeau

In Dr Philippi's account of the animal of this shell, (No 22 p 90,) he does not appear to be aware that I established a genus for it under the name of *Gadina* in the Philosophical Magazine for April 1824, where I showed the difference between it and *Siphonaria*. It certainly is not *Acmaea* of Esschholtz, which is synonymous with my genus *Lottia* (Phil Trans 1833) and Quoy and Gaymard's *Patelloides*.

Mr G Sowerby, in consequence of some confusion, has in the Proceedings of the Zoological Society described two or three other species of the genus *Gadina* under the name of *Mouretia*, erroneously considering it as my name for the genus, so that the synonyma of this genus will run thus —

Gadina, Gray, 1824, from *Gadin* of *Adanson*

Mouretia, Sowerby, not Gray

Clypeus, Scacchi

Patella, Philippi

Pileopsis, Payraudeau

Pandorina, p 296

This shell has been long described, although many authors, in common with Sr Scacchi and M Philippi, have considered it as a new species. On comparing a Neapolitan specimen which I have received under Scacchi's name, it appears to have the following synonyma —

1 *Mya Nitida*, O Fab *Naturforscher*, iv 44 t 10 f 10

2 *Mya Norvegica*, Chemnitz, x f 1647 48 Turton, *Syst Nat*
iv 170r Turton, *Dict* f 100

3 *Anatina truncata* Lam *Hist* not Sow

4 *Amphidesma corbuloides*, Lam *Hist*

Osteodesma corbuloides, Deshayes

5 *Mya striata*, Montagu, Linn *Trans* xi t 13 f 1 Turton,
Dict f 99

Lyonsia striata, Turton, *Bivalves*, t 3 f 67

Magdala striata, Brown, *Brit Shells*, t 11 f 2

Myatella ———, Brown, *Man-*

6 *Mya pellucida*, Brown, Wern *Trans* t 24 f 1

Ann Nat Hist Vol 4 No 25 Jan 1840

7 Pandora striata, *Dict Hist Nat* xxv

8 Pandorina? equivalvis Philippi, *Sicul* xviii t 1 f 11 a b c
Pandorina coruscans, *Scacchi, Sp Zool* 14 Costa

There is a second species very nearly allied to it, but which differs in being much narrower and longer in proportion *Lyonsia* is the oldest published name for the genus, *Magdala* was the name that Dr Leach first gave to it in his MSS, but he afterwards used *Lyonsia* Brown, not satisfied with adopting Dr Leach's earlier manuscript name, instead of *Lyonsia*, has also added a new one, viz *Myatella*. The shelly plate which is found in the hinge of this genus in the most perfect state of development, was, I believe, first described and figured by Mr Wood in his *Conchology*. This plate is peculiar to a group of genera, which I think for several reasons, especially on account of the general structure of the animals, should be formed into a family separate from the *Myadæ*. This family contains the following genera —

Anatina = Auriscalpium, *Schum*

Cochlodesma = Anatina, § 2 *Turton*

Periploma, *Schum* = Osteodesma (part) *Desh*

Thracia = Odoncinetus, *Costa*

Lyonsia = Magdala and Myatella, *Brown* = Osteodesma (part)
Desh = Pandorina, *Scacchi*

Myadora, *Gray* = Pandora (species) *Sowerby* = Anatina, *Stutchbury*, for Pandora brevis, *Sow*

Chamostrea, *Roissy* = Cleidotherus *Stutchbury*, not *Sowerby*, as quoted by Dr Philippi

Myochama, *Stutchbury*, and probably Cardilia, *Desh* = Hemicyclonosta, *Desh*

I described the animal of this genus in the first number of my 'Spicilegia Zoologica,' when describing *Lyonsia cuneata*. The species of the different genera of *Anatinidæ* pass very gradually into each other, and I do not think that *Lyonsia* has any affinity to either *Pandora*, *Solenomya* or *Galeomma*, the latter having many characters in common with *Gastrochæna*. *Lyonsia* has the piece in the hinge both in the young and adult state, and it may be remarked, that all bivalve shells, *Pandora* as well as the rest, have both a ligament and a cartilage, which is often called a double ligament.

Cryptostoma, p 298

There must be some mistake here. Neither the shell nor the animal of *Cryptostoma* in the least resembles either *Coriolla* or *Buccinum*, but is closely allied to *Natica*, and passes by means of *Natica melanostoma* into the typical form of that genus. The reason why the animals of various species of Lamarckian *Buccina* differ so considerably from each other, is that he has confounded in that genus many shells belonging to other genera. Thus, of the species noticed above, *Bucc Linnæi* is a *Columbella*, *Bucc mutabile* a *Nassa*, and *Bucc maculosum* a *Polia*, or subgenus of *Triton*, Lam. On the other hand, *Cardita* is by no means so very different from *Astarte*, into which it readily passes by means of *Venericardia*. Indeed, two fossil *Astartes* have been described by Lamarck as species of *Cypricardia*, which is the next genus to *Cardita*.

XXXV — *Notices of Botanical Excursions in the Neighbourhood of Trieste* By EDWARD FORBES, M W S, For Sec B S, &c *

I VISITED Trieste in the month of June 1838, and spent five most delightful weeks in the neighbourhood, making the town my head-quarters. No locality could afford greater pleasure to the botanist, Illyria being famous for the peculiarities of its Flora, and I was especially fortunate in finding two of the most distinguished Italian botanists resident in Trieste, M Tommasini and M Biasaletto, to whose guidance and to whose company I chiefly owe the profit and the pleasure I reaped during my stay. Trieste is beautifully situated on the Adriatic at the base of Monte Spaccato, one of the border elevations of that great and singular calcareous plain the Karst. On the south-east side of the town the country bordering the sea is somewhat flat as far as the boundary of Istria, a few miles distant, and presents us with the salt marshes of Zaule, on the north-west the bounding precipices of the Karst rise directly from the sea. The excursions which I shall notice in

* Read before the Botanical Society, Nov 14, 1839

this paper are, 1st, the immediate neighbourhood of the town, 2nd, Zaule and its neighbourhood, 3rd, Monte Spaccato and Lipizza on the Karst, and 4th, Contobello on the coast. These four excursions present a pretty good picture of the vegetation of the Triestine territory.

I In the immediate neighbourhood of the town, in fact forming one extremity of it, is a little wood called the Boschetto, the favourite promenade of the inhabitants, which it well may be, since there alone you find anything like a collection of trees, the country of Illyria being exceedingly bare, and trees are great treasures in such a warm climate. This grove is laid out in pleasant walks, and there are one or two coffee-houses where the Triestine gentlemen breakfast in the open air at a very early hour of the morning and where the Triestine ladies sip coffee towards dusk. In the evening it presents a very gay scene, and the botanist, resting there after his day's labour, finds himself greatly refreshed by the change from pretty flowers to pretty faces. In the Boschetto abound several rare and very interesting plants, such as *Chrysanthemum montanum*, *Chrysanthemum corymbosum*, *Thesium divaricatum*, *Inula hirta*, *Tragopogon floccosum*, *Potentilla pedata*, and *Polygala comosa*. Also some critical species of much interest to the British botanist, as *Lotus ciliatus*, Tenore, a southern form of *Lotus corniculatus*, *Ononis antiquorum*, and the *Lathyrus sepium* of Scopoli.

II The salt marshes of Zaule are about four miles from Trieste, and abound in rare and interesting plants. The road to them is rather level and uninteresting, by the wayside however I gathered undoubted specimens of the *Ranunculus verrucosus** of Sternberg, this being the original locality. Also in corn-fields *Bupleurum obovatum*, *Polygonum Bellardi*, and *Bifora radians*. On the hedges near Zaule I found two rare and beautiful plants, *Clematis viticella* and *Aristolochia rotunda*. In the meadows at Zaule grow *Holoschænus australis*, *Veronica latifolia*, *Brokhusia hispida*, *Gladiolus illyricus*, *Plantago altissima*, *Scorzonera laciniata*, *Scabiosa hybrida*, *Asparagus marinus*, and *Ornithogalum narbonense*, &c. The

* Perhaps not distinct from *Ranunculus Philonotis*

ditches were filled with *Gratiola officinalis*. Several British plants abounded, such as *Scabiosa arvensis* and *Rhinanthus crista-galli* and *major*, here accompanied by *Rhinanthus hirsutus**, a plant which possibly may be found in similar situations in our own country. The marshes of Zaule are famous for Orchideæ. Of that tribe I observed *Orchis pyramidalis*, *O. acuminata*, *O. laxiflora*, *Epipactis palustris*, *Gymnadenia conopsea*, and *Serapias oxyglottis*, certainly identical with the *Serapias longipetala*, as here were flowers of each species to be seen on one plant. The plant I have noted as *Orchis acuminata* exactly accords with Reichenbach's description of Defontaine's species, nevertheless M. Tommasini informed me that he sent it to Reichenbach as such, who sent it back as *Orchis variegata*, identical with the German species.

Ascending the hills of Istria, above Zaule, we found *Scabiosa integrifolia* and *hybrida* growing together—certainly only one species. *Trifolium patens* and that beautiful shrub the *Colutea arborescens* were common. On the hills themselves we found *Athamanta Matthioli*, *Marrubium candidissimum*, *Drypis spinosa*, and *Silene saxifraga*, and by the road side on our return to Trieste we gathered *Oenanthe gymnorhiza* and *Rubus tomentosus*.

III The excursion to Monte Spaccato and the Karst is probably the most characteristic of this singular country. To any one but a botanist the Karst is a place to be avoided, or passed over as quickly as possible. It is thus described by an English writer: "It is a table land of bare limestone rock, believed by geologists to correspond in age with the chalk separating Carniola from the coast land, or Littorale. It is a waste, like no other, not a tree within sight, scarce a shrub or even a blade of grass to relieve the painful glare of the white shattered stones which strew the surface. To use the words of a German traveller, the landscape might be painted with ashes and chalk." Horrid however as the Karst thus appears to be to the ordinary traveller, to the botanist it is a paradise blooming with rare and beautiful flowers, for every crevice on its bare surface presents him with plants which

* The seed of the Zaule plant does not however answer to Reichenbach's character of being "exalatus."

grow nowhere else, and every little oasis in its barren desert is radiant with flowers of exquisite loveliness, and odorous with fragrance of sweetest herbs. In ascending Monte Spaccato from Trieste, we pass over two different geological formations, the lower part being composed of conglomerate and the upper of limestone, each presenting a different Flora. The latter rock especially abounds with rare and local plants. The hill is a natural botanic garden, it is so covered with various species, which greeted us in such quick succession, that it was as much as I could do to carry away a few examples of each for myself without taking duplicates. Our progress upwards was first hailed by *Polygala comosa*, which abounds alike on lime and sandstone. *Andropogon Gryllus* and *Festuca glauca* are likewise frequent on the latter rock. The sides of the hill are covered by *Ostrya carpinifolia*, *Quercus pubescens*, *Pistacia Terebinthus*, *Rubus discolor*, *Cytisus capitatus*, and *Genista sylvestris*. Amidst these I picked a beautiful specimen of the splendid *Limodorum abortivum*. As we ascended to the calcareous strata many species quite new to me appeared, often of great beauty, such as *Berinia andryaloides*, *Convolvulus Cantabrica*, *Euphorbia fragifera* and *Onosma stellulata*, and plants past flowering of *Pæonia peregrina* were not rare. But the summit surpassed the sides there were concentrated the more beautiful plants we had passed, accompanied by *Genista sericea*, *Linum perenne*? and *narbonense*, *Veronica austriaca*, *Arenaria lancifolia*, *Euphorbia* (nov species near *Gerardiana*, Thomas,) *Genista diffusa*, *Arenaria verna* (the true plant, not the British), *Astragalus vesicarius*, *Silene Pseud-otites*, *Orobis versicolor*, *Hieracium peleterianum*, *Dictamnus fraxinella*, (which with *Clematis erecta* also adorned the sides), *Centaurea variegata* and a hundred others, "too numerous to mention." Of great interest to the botanist, on the highest point, grew *Spartium radiatum*, first found here by Mr. Bentham last year, and refound by myself. Among the plants past flowering I remarked *Gentiana angulosa*, *Scorzonera austriaca*, *Mercurialis ovata* and *Cineraria arachnoidea*, while *Centaurea splendens* and a host of *Dianthus*, as yet in bud, gave evidence of a harvest in a month or two as rich and as varied as that present. The view from the summit of the hill

was very magnificent, stretching over Frioul, Carniola and Istria, bounded on three sides by the snow-topped chains of the Alps, on the fourth by the blue Adriatic. At our feet lay Trieste.

Among the green spots on the Karst the most remarkable is Lipizza. Lipizza is truly an oasis in a desert: it is a wood about seven miles from Trieste, where the emperor breeds horses for his stud. Many of the most beautiful and rare plants of Illyria are found there, and some of its flowery denizens grow nowhere else. From Lipizza I obtained *Lilium carniolicum* and *bulbiferum*, *Delphinium fissum* (rariss.), *Medicago Karstiana*, *Potentilla recta*, *Potentilla inclinata* (not distinct from *P. canescens*), *Hieracium bracteatum*, *sabinum* and *obscurum*, *Scorzonera villosa* and *glastifolia*, *Loranthus europæus*, *Quercus cerris*, *Ornithogalum comosum*, *Lactuca perennis*, *Dianthus atrorubens* and *virgineus*, *Vicia sordida*, *Rosa rubrifolia*, *Iris graminea*, *Coronilla montana*, *Centaurea adonidifolia* and *Cerinthe maculata*. At Lipizza and other places on the Karst the localities richest in plants are singular basin-shaped depressions of the surface.

IV The excursion to Contobello, though not so rich as that to Monte Spaccato or Zaule, is interesting as exhibiting the sea cliff vegetation of this part of the shores of the Adriatic. On the way side between Contobello and Trieste grows the rare and beautiful *Rosa sempervirens*. On the sea-coast I gathered *Lathyrus Nissolia*, *Chlora serotina*, *Dorycnium pentaphyllum*, *Ruta divaricata*, *Lonicera etrusca*, *Palinurus spinosus*, *Rhamnus alpinus*, *Ethionema saxatile*, *Teucrium montanum*, *Trifolium angustifolium*, *Smilax aspera*, *Coronilla Emerus*, *Quercus Ilex*, *Verbascum nigro-austriacum*, *Salvia officinalis*, *Rubia peregrina*, *Phillyrea media*, *Ligustrum vulgare*, and last, not least, the loved plant of lady and poet, *Myrtus communis*, on its native rocks in full bloom, as fair and sweet there wild, as when petted and caressed in the finest garden.

XXXVI — *On the Habits of the Apteryx Australis, a Bird of New Zealand, closely allied to the Struthionidæ, and named by the native Inhabitants KIWĪ* By the late ALLAN CUNNINGHAM, Esq *

THIS most remarkable bird inhabits the densest and darkest forests in those near the Kerikeri and Waimate missionary stations, a few miles from the shores of the Bay of Islands, it was formerly frequently observed and taken, as it is still to be found in the woods of the Hokianga river. It is however by no means confined to any particular district, for it is to be met with in all the wooded parts of the northern island. In these humid forests it reposes during the day, either beneath the tufts of long sedgy grass a species of *Carex* everywhere abounding in the woods, or it hides itself, shunning the light in the hollows at the base of the ' *Rata* ' tree, (*Metrosideros robusta* A C — N S †) In these situations it constructs a very simple nest, laying as all agree, but a solitary egg, which is about the size of a duck's, or as some natives assert nearly as large as that of a goose, with which bird they are now familiar the missionaries and other Europeans having some time since introduced it to their poultry-yards. Its period of incubation could not be ascertained from the natives. No sooner are its native woods darkened by the presence of night, than it ranges about in quest of food, which (as all accounts inform us) is exclusively *worms*, procured by burrowing with its feet, and perforating slightly the soft humid subsoil with its attenuated bill, and doubtless it is directed in the night by powerful instinct to the spots where these abound, for its eyes are very small and its upper mandible, with the nasal orifices at its extremity or tip, possesses doubtless an acute sense of smelling.

It is not gregarious, and but very seldom indeed to be seen in small numbers generally they are in pairs (a male and female), and in the larger forests, less frequented by the natives, these pairs may be met with at distances of about a quarter of a mile.

The cry of the *Kiwī* at night is similar to the whistling made by

* Read before the Zoological Society, May 14, 1839. The communication was entitled " Rough Notes collected from the New Zealanders (by aid of the Missionaries), on the habits of the *Apteryx australis* dated Sydney, N S Wales, 26th Nov 1838, and accompanied the skin of an *Apteryx*, and also the body, preserved for dissection, which Mr Cunningham had procured during a visit to New Zealand — Our readers will learn with deep regret the loss which science has sustained by the death of Mr Cunningham, who has so greatly contributed to our knowledge of the Natural History of Australia and New Zealand, and whose valuable Flora of the latter country has just been completed in our pages — Ed

† Ann Nat Hist Vol iii 112

boys by the help of the fingers placed in the mouth,—a whistle with a hiss, and it is by imitating this sound that the natives decoy them, and either catch them by the help of dogs, or having induced the bird to approach near to them by the whistle, they suddenly surprise it by the glare of a lighted torch, which they have with them, concealed under their mats, when they seize it by the neck and thus capture it alive

In this manner the bird, the skin and body of which are now sent to England was taken and brought to me alive. It may here be observed, that the natives, when they proceed to the forest to capture these birds choose the darkest night and as the Kiwis usually wander about in pairs, the New Zealander readily distinguishing, by some difference of voice the sexes, endeavours to secure the female first, since the male will always linger about the spot to protect its mate, and will thus give the natives a fair opportunity to capture it also

When alarmed in the forest, the *Kiwi* retires precipitately into its darker recesses, running with considerable swiftness although its legs appear, from their shortness and strength, more fitted for burrowing than fleet movements

The legs afford the bird a means of formidable defence, for when hunted and overtaken by the small dogs and the natives it uses its feet effectively and it is said the dogs unskilled in the mode of seizing their prey have been greatly injured by its kick

Formerly when the natives, wearing solely their loose, airy, mat-dresses were altogether more hardy than they are in the present day, in which every man is rolled up in a thick heavy double-blanket of our introduction among them, and has thus become comparatively speaking effeminate and inert,—formerly the natives were skilful '*Kiwi hunters*,' delighting in the pursuit, and many a group would they form to go and pass a dark tempestuous night in the forest to decoy and catch these birds, the flesh of which, although said to be hard and sinewy, they greatly esteem. The feathers also were in request for making or decorating mats, by sewing them upon a groundwork of their native flax. Thus by their frequent night-prowlings in the woods, the natives have extirpated the *Kiwi* in some districts where it once abounded and although it is still an inhabitant of timbered regions less disturbed by the natives, it is rarely to be obtained, because these people have become less energetic and enterprising, and certainly less hardy by their adoption of the habits of civilized man than formerly, and therefore cannot often be induced, by a promise of reward however considerable, to spend

a gloomy night in the forest, in search of the bird, and without the aid of the New Zealander it cannot be obtained

The skin now sent home, the natives said, was of a male bird, and certain it is that whilst living it had a very strong and highly offensive smell. Some natives of the country at East Cape, on the coast, south of the Bay of Islands, who are residing with the church missionaries at Pahiia, on its southern shore, observed that the *Kiwies* of their forests are much larger and more powerful birds than my specimen taken on the Hokianga river. Might not those southern birds be of a distinct species? A C

XXXVII — *Characters of Four New Cape Orchidaceæ* By
Professor LINDLEY

LIPARIS *Capensis*, foliis binis ovato-oblongis obtusiusculis, caule erecto foliis longiore, racemo multifloro, bracteis herbaceis linearibus acuminatis pedicellis ovariorum longioribus, sepalis lateralibus oblongis obliquis labello æqualibus quam petala linearia brevioribus, labello subrepando basi cucullato, apice obtusissimo emarginato apiculo interjecto

Hab ad Cap B *Spei*, inter Zandplaat et Komga, *Drége*

HABENARIA *Dregeana* (A § 1 xx c), foliis radicalibus binis orbicularibus, caulinis linearilanceolatis setaceo-acuminatis imbricatis, racemo densissimo cylindraceo obtuso, bracteis floribus æqualibus, petalorum laciniâ anteriori glabrâ posteriori ciliatâ duplò brevior, labelli tripartiti lacinus carnosus acuminatus intermediâ longiore et obtusiore, calcare pendulo obtuso labello longiore

Hab ad Cap B *Spei*, inter Basche et Omtata, *Drége*

HABENARIA *ciliosa* (A § 2 b), caule folioso, foliis erectis lanceolatis canaliculatis imbricatis margine pubescentibus, bracteis foliaceis lanceolatis acuminatis margine et costâ ciliatis floribus longioribus, racemo denso cylindraceo, sepalis ciliatis, petalis obtusis glabris, labelli tripartiti lacinus filiformibus intermediâ longiore, calcare pendulo clavato ovarii longitudine

• Hab ad Cap. B. *Spei*, inter Basche et Omtata, *Drége*

HABENARIA *lævigata* (A § 2 *b*), glaberrima, lævigata, caule folioso, foliis lanceolatis canaliculatis acuminatis erectis imbricatis, bracteis foliaceis acuminatis subspiralibus floribus longioribus, labelli tripartiti lacinus filiformibus obtusis verruculosus ovario brevioribus intermediâ longiore, calcare filiformi longissimo

Hab ad Cap B Spei, inter Basche et Omtata, Drége

XXXVIII — *On the Occurrence of Squalus spinosus, Linn, on the Coast of Yorkshire* By ARTHUR STRICKLAND, Esq

ON the 11th of August 1838, a large fish was brought on shore at Burlington Quay, differing from any I had seen before, which had been caught that morning in a trawl net, its characters evidently bespoke it to belong to the shark tribe, but differing in many respects from any of those usually met with. Its whole length was $7\frac{1}{2}$ feet, its girth in the largest part (just behind the pectoral fin) was 3 feet 8 inches, its whole surface was covered with a skin strikingly different from the rough file-like surface of most of the shark tribe, being very smooth and slimy, but the upper part of the back was studded over with sharp white spines hooking backwards, the largest not above $\frac{1}{4}$ of an inch long, but varying greatly in size. Each spine was set upon a thin hard circular base about the size of a fourpenny piece. In some instances two, and in a few, three spines were clustered together, but were usually separate about one inch asunder. I could not perceive that they were placed in any order or pattern. These spines continued less abundantly down the sides, and seemed to cease altogether as they approached the belly, but were abundant upon all the fins. A distinct lateral line commenced above the insertion of the pectoral fin where it was slightly bent, and from thence ran in a straight line to the tail, where it bent upwards, and followed its course nearly to the extremity. The top of the head was quite flat, ending in a blunt round snout, the space between the eyes being somewhat more than that between the eye and the end of the nose, the eyes were large, and placed in the projecting edge that overhung the mouth. Nearly half-way between the eye and the end of the nose were placed the

nostrils, about $1\frac{1}{2}$ in extent the longest way, they were partially divided in the middle by two valves, the posterior one short and blunt, the anterior longer and pointed. The distance from the end of the nose to the mouth was 6 inches, the whole of this space between the nose and mouth was covered with numerous small open pores, probably the glands for the secretion of the mucus that covered the whole surface of the body. The mouth was furnished with three rows of teeth, with the commencement of a fourth row imperfectly formed. The outer or larger row was set upon an edge, but evidently movable, as some of these were doubled backwards, the rest were set behind these in lines, each tooth diminishing in size to the last. The teeth were thin and sharp, about half an inch broad, and a quarter of an inch high. The posterior edge was formed into two longish points, the upper one pointing partly upwards, the anterior side was formed into two much smaller points, pointing in different directions. There was no tongue, nor any appearance of one, the bottom of the mouth being smooth and hard. Seven inches from the mouth commenced the brachial openings, which were five in number, all placed in front of the pectoral fin, the first was 3 inches long, each increasing in size to the last, which was 6 inches. Immediately behind the centre of these commenced the pectoral fin, which was 11 inches in length, very thick and fleshy in substance, particularly at the base, the posterior edge thin and flexible, but as in all the fins except the tail, there were no perceptible fin rays or membrane, all being smooth and fleshy. This fin opened perfectly horizontally, or at right angles to the sides of the fish. Eighteen inches behind these commenced the ventral fins, which were equally thick and fleshy, 14 inches long and 11 inches broad, cut nearly square, between the posterior base of these fins was placed the vent. The space from that to the lower end of the tail was only 17 inches, from this point to the upper extremity of the tail was 23 inches, in one unbroken line, there being no distinct lobes of the tail as in most of the shark tribe. The edge of the tail was composed of indistinct fleshy rays covered with smooth membrane. A little behind a perpendicular line above the anterior base of the ventral fin was placed the first dorsal fin, which was 6 inches long, upon a base of the same length, 4 inches behind

this was placed a second fin, similar in all respects, except perhaps being cut a little more square at the end. From the front of the first of these fins to the end of the nose was a space of about 5 feet, without any other fin or projection except the small spines before mentioned. The colour of the fish was when I saw it, a few hours after it was caught, a nearly uniform reddish slate-colour, somewhat lighter on the lower parts, but it was described by the fisherman who caught it as having been more of a red cast, with blotches of a lighter colour, before it died.

The peculiar characters of this fish consist in the smooth slimy spinous skin (resembling in this respect some of the Ray tribe), the thick fleshy fins with the five branchial openings all placed in front of the pectoral fins, in having no central dorsal fin, no temporal orifices, no anal fins. In these respects it differs from any fish hitherto described as a British species. Nor does it agree with any I have been able to discover in any work I have yet had an opportunity of referring to

ARTHUR STRICKLAND

Burlington Quay

This species is the *Echinorhinus obesus* of Smith, who says in reference to it, "This shark is comparatively rare at the Cape of Good Hope. It is described by the fishermen as sluggish and unwieldy in its movements, and but seldom to be observed towards the surface of the water. When they obtain specimens it is generally at a time when they are fishing in deep water, and when the bait with which the hooks are armed is near to the bottom. In this respect it resembles the Scyllus or Ground Shark. If we were to regard only its internal organization we should be disposed to consider it as closely allied to that genus"—*Illustrations of the Zoology of South Africa*, by Andrew Smith, M.D., Part I. Pisces, pl. 1.

After an attentive examination of the particulars on this subject published in the Supplement to Mr Yarrell's History of our British Fishes, Part II p. 54, I have no doubt that all the specimens, and the various synonyms employed, refer but to one and the same species at different periods of its existence.—A. S.

Note — Since the receipt of Mr Arthur Strickland's communication, the second portion of a systematic arrangement and description of sharks by Drs Muller and Henle, published at Berlin, has been received in this country, a reference to which appears to confirm the opinion given by our friend that the various published accounts of a spiny shark refer but to one species. The following are extracts from this valuable German work, p 91 —

Second Family SCYMNI

Second Genus *Echinorhinus*, Blainv — *Goniodus*, Agassiz

Species 1 *Echinorhinus spinosus*, Bonap

Le Bouclé, *Brouss* p 672 21

Sq spinosus, *Linn Gm* 1500 27

Squale bouclé, *Lacep* 1 p 30 tab 3 f 2 *Cop Encyc* p 11 n 22

Sq spinosus *Bl Schn* 136

Squale bouclé, *Risso Ichth* 42

Scymnus spinosus, *Risso Hist* 136 *Cuv* 393

Leich boucle, *Dict des Sc Nat* pl 28 f 2

Echinorhinus spinosus, Bonap 13

Sq (*Echinorhinus*) spinosus, *Blainv Faun Franç* p 66

Goniodus, *Agassiz*, vol iii tab E f 13 (Teeth)

Hab Mediterranean sea and the ocean

Examples, stated to have been seen by the authors of the work — One in the Museum at Leyden, one from the Cape by Dr Smith

The coloured figure of this shark sent us by Mr Strickland, so closely resembles Dr Smith's figure, as to make a second illustration unnecessary — EDIT

XXXIX — *Horæ Zoologicæ* By SIR W JARDINE, Bart.

No II *The History and Habits of Crotophaga continued from page 171, by the Notes of Mr Schomburgk on the Manners of the Birds in Guiana*

In a lately published number of the *Annals* we commenced a series of papers with the view of giving information as it occurred, and in the hope of calling attention and eliciting additional facts relative to the subjects which were treated of. It is highly satisfactory for us to think that our anticipations have

been so soon replied to Mr Schomburgk, in a recent visit, communicated many interesting traits in the manners of the birds of Guiana, and upon submitting to him the proof sheets of the preceding paper, p 160, which had been just received, he kindly offered to write out for our "Horæ" the notes which he had collected upon the habits of the *Crotophagæ* in the different localities where he had met with them. These notes in general agree with those of our Tobago correspondent, and, in the breeding of the birds particularly, confirm what was stated regarding the incubation of *C rugirostra*, identical with the smaller Guiana species. They leave however the curious question of some species at least (*C major*) using a common nest in a manner undecided, though we must confess that information gathered in a proper way from natives has been generally found to be correct in its most important parts. The facts mentioned of their feeding, proved them as observed to be nearly omnivorous, but we still consider insects and fruits to be their principal food. We should also be prepared to find them occasionally eating carrion, but it may be a question worthy of notice whether the birds observed by Mr Schomburgk on the dead sheep were employed in eating the flesh, or in collecting insects or larvæ which in a warm climate might be very soon attracted to, or engendered in animal matter*. Their resemblance in manners to the *Corvinæ* is also strikingly related, this may be one of analogy only, both the external form of the members and the internal structure appearing to lead to other groups, at the same time, as our facts accumulate, it may be found that the *Crotophagæ* may be more correctly placed among the "Rasorial Crows," the *Glauconinæ* of Sw exhibiting in the form of the foot the scansorial deviation.

"I have perused with great pleasure your notes on the History and Habits of *Crotophaga*, and as this genus, by the pe-

* Mr Schomburgk informs us that "without further proofs to warrant a belief of their being carnivorous, he should rather think they were feeding on the larvæ. The distance was too great to determine whether they were tearing at the carrion or merely regaling themselves on the insects. In either case it would seem that they are not over nice in the selection of their food, and that the smell of putrefaction is not repulsive to them"—Ed

cular form of its beak, and its curious manners, is so well qualified to attract the attention of the most careless observer, it may be naturally supposed that it did not escape me

“ You observe very justly, that at this time the specific distinctions of this genus are not well understood, and that only with the possession of an extensive series from various localities, the value of these distinctions will be ascertained. The bird which you consider allied or identical with Mr. Swainson’s *C. rugirostra* appears to be the most common and the most widely distributed species. I have now a specimen before me which so accurately agrees with your description of that from Tobago, that there is not the slightest deviation in the dimensions or markings. My specimen was shot in the neighbourhood of Fort San Joaquim on Rio Branco, in lat 3° 1' N. The same species inhabits also the Virgin Islands, where they are known under the name of ‘ *Black Witches* ’

“ The account of your correspondent, Mr. Kirk, of their habits is graphic, and does not materially deviate from my own observations, but he has forgotten to note that they prove very destructive to pigeon-peas (*Cytisus cajan*), and their sojourn in the negroes’ provision-field is by no means cherished by them. Mr. Kirk alludes to the circumstance of having found Guava seeds (*Psidium pyrifera*) in their stomach, and I have to add, that they are partial to this fruit. I recollect that on riding one day from Cruxbay towards the eastern part of the island of St. John’s, I saw in the vicinity of the estate Biverhoutberg a flock of *Crotophagæ* on the carcase of a sheep, on which they were feeding. I was astonished at the circumstance, but not so my companion, who told me he had noted their carnivorous habits before. They resemble in that regard the *Corvidæ*, indeed there are several points from which we might trace an affinity to that group. You have noted, p. 170, the resemblance of the tongue of the *Crotophaga* to that of the *Corvinæ*, and the intestinal canal which approaches to that of some of the *Fissirostres*. But there are other resemblances in their characters and habits which are perhaps more striking. They live in numerous bands, are omnivorous, build their nest in the manner of the *Corvidæ*, are clamorous, bold, advance on the ground by hopping, and like our raven and mag-

pie, have at all times been objects of superstition to the common people

“Setting aside the peculiar shape of its beak, the *Crotophaga* resembles the *Corvidæ* further in some points of its outer appearance. Its form and graceful motions when gliding through between the branches of the trees and shrubs or when on the wing remind us of the genera *Pica* and *Garrulus*, at the base of the bill we observe setaceous feathers, a character of the *Corvinæ*, the fourth quill is the longest, colour entirely black, glossed with violet reflexions like the genus *Corvus*. The flesh has a disagreeable odour, nevertheless I have been informed that this does not deter some of the negroes from eating them, and I have been more than once told, that they are used as substitutes for pigeons or rooks in pies

“I agree perfectly with Mr Kirk that they do not build their nest on the ground, it is generally built in the fork of trees but although the construction of the nest resembles that of the *Corvidæ*, it is built at a less height from the ground. I cannot substantiate by ocular evidence that they breed in community, but I have heard it always asserted of the larger species (*C major*). The Indians have told me on inquiry, that in the nest of the smaller species, which you call *C rugirostra*, they find only from five to seven eggs, but in those of the larger they are so numerous that they fill a whole calabash. The Indians, at least the Warraus and Arawaks, eat these eggs, and their evidence that they take such a large number of eggs from the nests of *C major*, confirms the belief that they use a common nest. Sororeng, one of the Indians who has accompanied me to London, and who served me as interpreter during the last expedition, assures me that he has seen three birds of the larger species (*C major*) which they call *Woworima*, sitting in one nest, and on asking him how many eggs he saw in the nest, he designated the number by pointing to the number of his fingers and his toes

“I have noted both species (*C major* and *Ann rugirostra*) along the rivers of Guiana, they are therefore not peculiar to savannahs. When ascending the rivers Essequibo, Parima, Rio Branco, Orinoco, &c we observed them frequently along the woody banks of these rivers disturbed by the noise of our

canoes, they sounded their shrill notes, and followed in short flights from shrub to shrub. The Indian is no friend to the *Crotophaga*, he has an idea that this bird cannot bear the human whistle, and flies as soon as it is sounded. Our Indian guides amused themselves therefore frequently in breaking out on a sudden in a shrill whistle, and were highly delighted when the startled birds took to their wings. I subjoin the Indian names for the lesser *Crotophaga* (*C. rugirostra*). It is called in the *Lingua Geral* which is spoken in the province *Para Ano Curauca*, in the Arawak *Cunuba*, in the Macusi *Owown*, in the Wapeshana *Houwi*. *C. major* is called *Woworima* by the Macasis, and *Cosac* by the Warraus."

[To be continued]

XL — *Information respecting Botanical Travellers*

Mr Schomburgk's recent Expedition in Guiana

[Continued from p 266]

THERE are contradictory accounts among the Indians of a species of a cat, which in size and spotting resembles the Cheta (*Felis jubata*). Its ground colour is yellowish-fawn, and the spots are of a uniform colour and full and complete. Such appeared the cat to me which I saw watching me as related above*, and although I have doubted the evidence of my eyes, the existence of such a species has gained additional strength by the circumstance, that, on visiting the British Museum with the three Indians who accompanied me from Guiana to England, they took the Cheta to be a specimen of that species which is indigenous to Guiana, and identical with the one which annoyed us so much.

In the Supplement to Buffon's 'Histoire Naturelle,' tome III planche 38†, the figure of a cat is given which agrees with the one which I saw at Curassawaka, and it would be remarkable if, after all

* See p 265

† Nous donnons ici la figure d'un animal de l'espèce des léopards ou des jaguars. Le dessin nous en a été envoyé par feu M. Colinson, mais sans nom, et sans aucune autre notice. Et comme nous ignorons, s'il appartient à l'ancien ou au nouveau continent, et qu'en même temps, il diffère de l'once et du léopard, par la forme des taches et plus encore du jaguar et de l'ocelot, nous ne pouvons décider auquel de ces animaux on doit le rapporter, seulement il nous paroît qu'il a un peu plus de rapport avec le jaguar, qu'avec le léopard.—*Ibid* p 218

traces of the animal which that figure represents appear to have been lost, it should be found to be a native of Guiana

I mention another species from the reports of the Indians, and which the Arawaks call *Waracabba Arowa* or Trumpeter Tiger* They are equal in size to the former, and are said to go in small packs of six or eight, following their prey as well by scent as by sight The Indians describe them as very ferocious, and say they will attack man and all the larger quadrupeds which range through the forest They shun human habitations, and are only to be met with in the thickest forest They are called *Waracabba Arowa* from having a bluish breast resembling that of the gold-breasted trumpeter (*Psophia crepitans*) otherwise they are described to be yellow and spotted, whether contiguous or ringed I could not ascertain

The *Abouya Arawa* or Peccary Cat of the Arawaks is a powerful animal for its size It measures about 4 feet in length, and the tail from 16 to 18 inches its colour is a yellowish-brown, not near so yellow as that of the jaguar (*Felis onca*) The lower parts are white, and the forehead is marked by four or five bands, which run transversely from the eyes towards the muzzle The spots on the back are formed in oblong stripes, running from the neck to the tail, and each having a spot in the middle The two lateral bands extend to the fore limbs, the rest of the body is covered with irregular blotches, which in the vicinity of the neck and the breast assume the form of small spots Its tail is much shorter in proportion than any of the other species, its head is large the neck thick, with great strength in its fore quarters It frequents the habitations of man, and commits great destruction among sheep and hogs In case of necessity it does not despise poultry I conceive this species to be the *Felis macrourus* of Prince Maximilian of Neuwied

The Labba Cat —As I have not myself seen that species, I add Mr Vieth's account "This species is about the size of a wild cat The spots are larger in proportion than on the other species, and are on a light brown ground, indeed the blotches resemble those of the jaguar, and are more frequent on the legs They are very destructive to poultry, and enter the fowl-houses without fear I have stuffed several of them, one, which was brought by one of my huntsmen, was sticking all over full of the prickles of the porcupine, which animal I have no doubt it had been attacking "

Labba is the Arawak name for the spotted cavia, on which they prey as well as on other small animals The subject which Mr

* I repeat again that the name of Tiger is bestowed generally by the colonists on these cats

Vieth described to me appears identical with Wilson's *Felis Pardalis*

There is a variety of that species which the Indians call the *Aguti* or *Aguti-cat*, it is of the same colour as the foregoing but the spots are small, and very thickly spread over the whole body. They are somewhat larger than a domestic cat and are equally destructive to the feathered stock as the former. They frequent the plantations, as the sugar cane fields afford them always a safe retreat. They have received their name from the *Aguti* (*Dasyprocta Aguti*). It forms no doubt one of the varieties of *Felis pardalis*.

The following two spotted species are considerably smaller than the foregoing, and are named by colonists 'tiger cats'. The *RAT-TIGER* of the Arawak Indians is beautifully marked. The ground colour of the skin is of a fawn colour, marked with black oblong spots on the head and shoulder, and with circular patches which surround spots of a redder colour along the back and sides, the thighs are surrounded with black bands, assuming a lighter tint inside. The tail is alternately ringed white and black. They are not so large as the former species, and vary from 2 feet to 2 feet 4 inches, of which the tail alone measures from 8 to 9 inches. I think it may be identified with Linnæus's *Felis tigrina*.

The second variety is less than a domestic cat, and has large spots on a bright yellow ground. Its fore paws are remarkably strong in proportion to its size, and it frequents chiefly thick woods, where it preys upon birds.

I shall now give a short description of the spotless cats which inhabit Guiana, of which the first that engages our attention is the black cat (*Felis nigra*?) or tiger as it is called *par excellence* by the Brazilian of the Rio Negro. During our expedition in the interior of Guiana we were not so fortunate as to fall in with a specimen of this cat, although we were told by the Indians that it existed in British Guiana, and frequently committed great ravages among the herds of wild cattle in the savannahs of the rivers Takutu and Branco, and was not unfrequent on the Upper Orinoco and the Rio Negro. Its geographical distribution extends therefore from the coast regions of Guiana beyond the equator. Mr Vieth had been told by the Waccawais, that they had killed specimens from time to time above the great cataract of the Demerara river, and there can be no doubt of it, as those tribes who inhabit Guiana possess names for it. They are called *MAIPURI-TIGER*, either from their colour, which resembles that animal (*Tapir americanus*), and perhaps, and more likely, from their preying on the *Tapir*, as it is a common custom among the Arawaks,

if we except one or two instances, to name those cats generally after the game on which they prey I have seen a fine skin of that species, the back of which was of a shining black, lightening to a mouse colour on the belly, the paws were black, and its claws larger than those of the jaguar, the whiskers strong, and a tawny-coloured spot above each eye must give to that organ a peculiar appearance when the creature is alive The tail is longer in proportion to the size of the animal, if compared with that of the jaguar, and in its head and form it resembles much more the Wawula (*Felis concolor*), than the Arichibana (*Felis onca*) It is said to be more ferocious than the latter, and attacks man more frequently The skin measured from the tip of the nose to the insertion of the tail 3 feet 7 inches, the tail $16\frac{1}{2}$ inches or the whole skin almost 5 feet, but if the accounts of the Brazilians on the Rio Negro are to be believed, it surpasses in size the largest jaguar I could not judge whether it was a young or a full grown animal The Indians told us, that they subsist upon the Tapir, the Capybara (*Hydrochærus capybara*), the Peccary (*Dicotyles subniger*), the different species of deer which frequent the forest and savannahs, which they surprise by stealth The Indians appear to have a great dread of them

The Indian distinguishes two species of the Puma, the WAWULA or Deer Tiger and the SOASOARANNA The latter appears to be more restricted to the open savannahs of the Orinoco, the former frequents as well the coast regions as the savannahs I have recognised in the two specimens which the Museum of the Zoological Society possesses, the Puma of the Orinoco, and although they are generally not known in British Guiana, I have seen a skin of one which had been killed above 40 miles up the Demerara river The head seemed to be small in proportion to its size, the body was long, and the fore feet very stout, its tail, as far as I can remember, more than half the length of the body, and ending in a tuft of black hair

I am enabled to give a more detailed account of the second species, the WAWULA AROWA of the Arawaks, or Deer Tiger of the colonists In colour they are of a reddish-brown which lightens on the outside of the limbs, and assumes a white colour on the belly Of a similar colour is the breast, and the reddish-brown which is the prevailing colour of the body is of a lighter tint at the muzzle and chin It is covered with thick fur, which relates likewise to the tail, which, as in the Puma of the Orinoco, is black on the tips The eyes are of a brown colour The head is small, higher in proportion than any of the spotted kinds, strongly built before and light behind Its proportion will become apparent from the following

measurement of a subject which was killed at the savannahs of the Rio Branco, and which is now in my possession. It stood behind 2 feet, and before 1 foot 10 inches, and its whole length from the nose to the tip of the tail was 6 feet 2 inches

	ft	in
Length from back of skull bone to insertion of tail	3	1
Length of tail	2	4
Length from point of shoulder to malleolus of fore foot	1	5
Girth of fore leg below point of shoulder	0	8½
Girth of fore leg immediately below the knee	0	5½
Length of the knee joint to malleolus	0	10
Length of the sole of the hind foot	0	4
Breadth of ditto	0	4
Girth of the middle of the belly	2	2
Girth of the body near the shoulder	1	10
Length from tip of snout to posterior extremity of the skull	0	9
Space between the base of the ears	0	4
Length of the ears	0	3½
Space from eye to nostril	0	2½
Hind leg from hip joint to sole of foot	1	9
Hind leg from knee joint to ditto	0	5
Length of fore claws	0	0½
Length of hind claws } middle claw		

It is very destructive to the cattle farms, and it is so powerful an animal, that I have been told by an eye witness, that it killed a mule and dragged it across a trench to the opposite side, although the trench was not quite full of water, and the Puma had to drag it a few feet up hill, after it landed with its prey on the other side. My informant, who had watched its proceedings, had meanwhile sent for his gun, and shot him while attempting to pull the mule into the wood. They seem to be particularly partial to dogs, and a great number of those which are kept by the settlers for the purpose of hunting are killed and eaten by them. They follow in the woods the herds of Peccaries, and watch their motion in order to seize upon the stragglers, being well aware that if they attacked the flock, they would be overpowered and torn to pieces. They hunt as well by day as in the night, and feed also on deer and the smaller domestic animals. They give birth to two young ones, seldom three, which have spots of a darker hue, more or less visible, according as the lights fall upon them, and which I have been told they lose after the first year.

Cuvier doubts that the cats just described form two different spe-

cics I do not venture to combat his opinion, as I saw only a skin of the Puma of the Orinoco, which was similar to the specimens at the Museum of the Zoological Society, and agrees with Mr Bennett's description while the second, and of which I possess a specimen, resembles Wilson's figure of the *Felis concolor*.

The WILLIBISSIRI AROWA is likewise an unspotted cat, and is exceedingly rare in Guiana. It is of a light gray colour, approaching to white on the belly, its snout is of a reddish-brown and has a white spot on the breast its tail is of the same thickness throughout, and it does not possess the black tip of the Puma. It is about 2 feet 6 inches long, and stands high in proportion to its size, strongly built before with stout neck and small head. Mr Vieth gave me the following note on this cat "I have had two of these animals, one was killed by a negro at Mr Patterson's at the Demerara river, while in the act of killing a turkey, the other in the same neighbourhood while swimming across a river. I had them both at the same time, and showed them to Mr Brandes, famed as a great huntsman, and who has killed of almost every species of animal in our colony, but who appeared to be unacquainted with that species of cat. However the Waccawu Indians who inhabit the upper Demerara river, and some of whom I had in my employ, did not seem to think it a rarity, and told me they had seen and killed them from time to time." It has received its Arawak name *Willibissiri Arowa*, from the smallest species of deer which Guiana possesses, which this cat resembles in colour and on which it preys. I conceive it to be the *Felis jaguarondi*, or rather that variety which Dr Traill describes as *Felis unicolor*.

The HACCA AROWA is the last species of cat that I have met with or heard of during my expeditions in Guiana. It resembles the preceding in size and form, but differs in colour the adults being of a deep shining black, the belly dark mouse, with a tawny-coloured spot over each eye the tail is without rings. Although not very common in Guiana, they are by no means rare, and the Indians use the skins for manufacturing caps, shot pouches, &c. They prey upon small animals, as Pacas, Agutis, and are also destructive to the feathered game. It appears to agree with Temminck's variety of the *Felis jaguarondi*, which he saw in the Paris Museum.

From the above description it will be observed that eight spotted, and five spotless cats are named, all of which the Indian distinguishes by different names, but while the naturalist would hesitate to adopt his distinctions as specific, and considers the greater number mere varieties, we must confess that we know but little how far their

structure diverges, and might warrant us to adopt them, in addition to the difference in spotting and colouring, as specific characters. I have had but little opportunity to extend my investigations to anything further than to the observations which a skin, sometimes mutilated, afforded, but it is evident that Guiana possesses two very distinct forms, of which the Jaguar (*Felis onca*) and the Puma (*Felis concolor*) offer the typical forms. The jaguar is the strongest, and most powerful of the *Felina*, and to what astonishing size it reaches, may be concluded from the circumstance, that Mr Vieth found during our last expedition, on a savannah on the banks of the river Padauri a tributary to the Rio Negro a skeleton of a tiger which measured nine feet. It had been much mutilated by the vultures, but Mr Vieth carried the skull, which was perfect, and which is now among my collections. The spotted kinds all bear a striking resemblance to each other: their heads are broad, the fore quarters remarkably strong and full of muscles, the chest broad, and their tails shorter in proportion than those of the spotless cats. Not less remarkable is the likeness of the unspotted species, their heads are small, the neck nearly the same thickness, the fore legs very strong and powerful, the hind legs taller in proportion, and the tail long, furry, and brush like. These two forms are evident to every common observer, but it will want more knowledge of their anatomical structure to form the subordinate sections. In their habits they are all voracious, and prey upon animals much larger than themselves. They hunt chiefly by night, but when pressed by hunger destroy and carry away their prey in the open day. The larger species of the spotted kind are all excellent swimmers, and cross over rivers, or visit the islands where the Capybaras are generally found, and which seldom escape the fatal bound. Although there are several instances, yet comparatively speaking they seldom attack man, but they do not seem to fear him, as they enter the huts of Indians, and carry away their dogs, while they leave their owners undisturbed in their hammocks. Their claws are the chief instruments of attack and defence, and they are for that purpose strongly hooked, and capable of being retracted whilst not in use. Their canine teeth are strong, two in each jaw, cutting teeth small, and grinders shaped like an arrow head.

BIBLIOGRAPHICAL NOTICES

Histoire Naturelle des Poissons d'eau douce de l'Europe Centrale
Par L^s Agassiz 1^{er} Livraison, contenant les Salmones Oblong
folio Neuchatel, 1839

Natural History and Illustrations of the British Salmonidæ By Sir
William Jardine, Bart Part First Elephant Folio Edinburgh,
1839

On the Growth of the Salmon in Freshwater By William Yarrell,
F L S , V P Z S , with Six coloured Illustrations of the Fish of
the Natural Size Oblong Folio Van Voorst London, 1839

The titles of the works which we have placed at the head of this notice will show that the interest which the Natural History of the Salmonidæ has of late excited, has in no way decreased either in this country or on the Continent, and we sincerely trust that the individuals who are now devoting their talents to the elucidation of the habits and structure of this family of fishes of much importance commercially and possessing great scientific interest, may be enabled to carry on their investigations until the complete history of the subject is attained

At the commencement of the present century, the history of the British fishes composing this family had for a considerable period remained stationary But then, various experiments began to be tried, with the view of ascertaining the time required by the fry or smelts to attain a certain weight after leaving the rivers, which was very satisfactorily established, showing a remarkably rapid increase in weight and size This fact, previously surmised, had given rise to the conclusion, that the young on hatching from the ova increased with equal rapidity, while the history of a little fish provincially known in Scotland as the *Parr*, created much discussion, and no little difference of opinion, whether it was a young state of the Salmon or a full-grown and perfect fish The immense decrease of the Salmon fisheries also called for investigation, and although the habits of the species which composed the chief staple of the fisheries were practically known to the taxmen, the proprietors or their factors were not sufficiently conversant with their growth, migration, or breeding, either to impose salutary restrictions in the leases, or to check the indiscriminate and over killing of the fish, which was almost the sole cause of the decrease, the latter caused the appointment of various Parliamentary Committees, which published reports containing an

immense but undigested mass of information, and which might have elicited much more had the members of them given some attention to the obscure points in the history of the family before examining the witnesses. The difficulty of investigating the subject is we acknowledge great, and when we know that it has been undergoing strict research by persons well qualified for the task for several years without complete information being obtained, we feel even more anxious to understand the mystery which involves the "lives and loves" of these very valuable inhabitants of our rivers and oceans. Mr Yarrell, Sir W. Jardine, Dr Parnell, and Mr Shaw of Drumlanrig are all either now, or have been very lately working on this subject, and the fruits of their researches will eventually leave little to be accomplished. Sir Francis Mckenzie of Garloch is about to form extensive stews for the breeding of salmon, and to re-perform some of Mr Shaw's experiments. The experiments of the latter observer detailed to the Royal Society of Edinburgh and published in Professor Jameson's Journal, are of the greatest importance, they have been conducted with great care, and so far as they have been prosecuted have been accompanied by results as satisfactory perhaps as we could expect from the whole difficulty of the subject. The sum of our knowledge at the present time, so far as regards the common Salmon is, that we have hitherto been in error in considering its growth to be rapid during the first stages of its existence, and that it does not migrate until at least one year's residence in the fresh waters. On reaching the sea however the increase in size becomes very great, exceeding one pound in weight monthly. It has been further proved incontestably we think by Mr Shaw, that the great proportion of the small fish called *Parrs*, or in the English rivers *Pinks**, are the first state of the young Salmon previous to its assuming the migratory dress, but the additional proposition that the *Parr* does not exist at all as a distinct fish, is extremely questionable, and still requires investigation. At present the opinions of all our best ichthyologists are in favour of its distinctness, and the minute and careful differences detailed by Dr Parnell in his "Fishes of the Frith of Forth," go very far to prove everything that is wanting. The history of the other migratory fish remains nearly in the same state in which it has been for the last thirty years, though the works before us have commenced their elucidation, and some experiments are now in progress. The geographical distribution of the species has not been at all at-

* See Mr Yarrell's figures in the work we have placed at the head of this notice.

tempted, and the facts which relate or bear upon it are few in number

The publication of the History of the Freshwater Fishes of Central Europe by M. Agassiz has been looked forward to with interest by British ichthyologists. Some of the plates for it were engraved so far back as 1832, and the long time which it has been known to be in preparation, with the high scientific character of its author, raised the expectations of those who were studying the same subject. The first livraison of plates has now reached this country, accompanied only with simple explanations so that we do not yet receive the views of M. Agassiz upon many of the obscure points, but can only guess at what may be his probable conclusions. The mode of publication is however otherwise excellent each livraison being intended to contain complete illustrations of a family or group, so that the whole is brought under review at once and is not scattered about as so commonly occurs in works which appear in numbers. The descriptive letter-press to this part is promised with the plates of the second which are to illustrate the *Coregoni*.

The plates are lithographic, are minutely executed, and those devoted to the details of the fins, scaling and magnified figures are very useful. A plate of details is given with each species. The others represent the fish in its various states incident to age and season. The first series show the Salmon, M and F, in its breeding dress, and a female in the state of summer or high condition after having newly entered a river. These figures lead us to believe, what we have long suspected that the Salmon of many of the continental rivers differed or was not identical with the common British fish. They are reduced from specimens upwards of three feet in length, at this age and size the tail in both sexes of the latter would be completely square, and the scale represented fig 3 tab 1a is fully two-thirds less. The markings in tab 2 also differ much. Six plates are devoted to the illustration of *S. fario*. Some of the figures are of importance as showing what is to be understood by the *S. marmoratus*, Cuv., and the *S. sylvaticus* of Shrank but with the English synonyms we cannot agree, they are given, "the Trout, the common Trout, the river Trout, the Gillaroo, the Parr (a young Trout)." Now the Gillaroo of Ireland still requires investigation and we have reason to believe that it will form a distinct species. The Parr of Scotland has no connexion with *S. fario** and the

* For distinctive characters between the Scotch Parr and common *S. fario* see Sir W. Jardine in Proceedings of Berwickshire Club. For characters separating it from the young of the Salmon and migratory Trout, see Mr. Yarrell's British Fishes, and Dr. Pinnell, Fishes of the Firth of Forth.

figure given as the supposed "*Parr* or young Trout" has been undoubtedly designed from a young specimen of true *S fario*. We may also remark that all the examples figured are from specimens agreeing with a very marked but not uncommon variety of the Scottish *S fario* found in the smaller alpine streams. On tab III *b* are given representations of the head of a deformed Trout, similar to that represented by Mr Yarrell, and which we know to occur in several lochs in Wales and in Scotland, and to be not uncommon in the localities where it is found. The malformation is extremely uniform or similar in all the specimens or representations of it which we have seen, but the cause has not yet been noticed, nor has it been attempted to be accounted for. Is the race continued by breeding?

Seven plates illustrate two species of migratory Trout which are given under the names of *S trutta* and *lacustris*, Linn *. In these we think we recognise the two British fishes which have been confounded under the provincial name of "Sea Trout". They are very distinct in some of their states, and the form of the tail distinguishes them, together with the colours during the breeding season, but we should have preferred to have seen figures of these species when in high condition, residence in a lake may in various ways influence the form. The young of these fish constitutes the *S albus* of Fleming. Should the *S trutta* of this work not stand as *S eriox* of Willughb?

The Char are all placed under *S umbla*, Linn, and the "Welsh Char" is given as an English synonym. Although we know the Char to vary very considerably, we are inclined to refer the British fish to two species, chiefly distinguished by the great difference in the scaling. Those figured by M Agassiz seem all referable to the "Northern Char" of modern British writers.

S hucho of the Danube, unknown in the British waters, is represented in the young and adult states, and the last plates delineate the *Thymallus vexillifer*, Agass, or Common Grayling, found only by the British ichthyologist in certain districts in England.

In looking at the list of the Salmon of Britain and Central Europe comparatively, we are prepared for a close resemblance of species, but from the work before us we perceive one species, *S hucho* of the Danube, which does not occur in Britain or Ireland, while we find omitted the *Bull Trout* of the river Tweed, (the *S eriox* of some authors, but not of Willughby,) and the great Trout of the Scotch, Irish, and North of England lakes. These we have no doubt in being distinct species, and it appears to us remarkable that the latter should

* We are presuming that the *S lacustris* here given is a migratory species, and if so we think the name objectionable.

be wanting to the Swiss lakes. Among the common Trout, *S fario*, we feel inclined to adopt more species than those of the Swiss ichthyologist, but as the specimens now figured are chiefly river varieties, and certainly all one species, we are not so able to judge how the varieties in the lakes of Central Europe agree with those from the lochs of Scotland and Ireland or how the characters which we think entitle them to separation are kept up in other localities. We shall look anxiously for the appearance of the Second Livraison and the letter-press, when we shall endeavour to enter more fully upon this curious subject, in the mean time we would wish that encouragement to the work in this country which is due to the persevering zeal of its author.

The History of the British Salmonidæ, by Sir W. Jardine, which stands next upon our list is a work which has also been some time in preparation, and of which the first Fasciculus of six plates is now published*. The figures are here drawn as near the size of life as that of the paper will admit of and are engraved with the view of giving the effect of the newly taken fish, all the details of anatomy, scaling, and outward structure, which require most minute execution, being reserved for the volume which will contain the descriptive letter press, and which will appear with the last fasciculus of the plates. The sketches for the colouring we know to have been nearly all made at the water's edge from the fish when newly caught thus endeavouring to preserve an imitation of the rich tints which so quickly fade, and are lost in preserved specimens, and the department itself has been entrusted to, and performed with much credit by Mr. Bayfield of London. It is expected that the whole species found in the waters of Britain and Ireland will be illustrated in six fasciculi, or upon from thirty-six to forty plates.

On the two first plates before us are figured the Gilse or state of *S salar* before having spawned, the second being named with a ² and considered to represent the same state of the second species of British Salmon, whose history has scarcely yet been noticed by our ichthyologists. Plate 3 represents *S albus* of Fleming, given under that name to identify without doubt the fish alluded to in the "British Animals," and so often referred to by our modern writers. This is now known to be the young of our migratory species confused together, and in this state extremely difficult to separate. 4 is a variety of the large *S ferox*, which we noticed M. Agassiz does not include in his list of the fishes of Central Europe, the specimen is

* See Prospectus published in Annals of Nat. History, vol. 11 p. 138

remarkable for the close and numerous spottings over the whole body 5 are two beautiful lacustrine varieties of *S fario*, and 6 exhibits figures of the Lochmaben *Coregonus*, *C Willughbeni*, Jard The second fasciculus, which is in preparation will contain, 1 *S salar*, adult male in the dress of the spawning season, 2 *S salar* in a very young state, 3 *S trutta*, adult 4 *S trutta* in the dress of spawning season, 5 *S fario* river varieties, and 6 *S fario* in the spawning dress

The work of Mr Yarrell forms another interesting addition to our knowledge of the Natural History of the Salmon The young of the Salmon (in the district where the experiments were made called Pinks) were put into an artificial lake on the property of Thomas Upton Esq of Ingmire Hall having no outlet or feeder by which other fish could gain admittance These were afterwards taken at intervals of from eleven to twenty-seven months, and Mr Yarrell's description and plates detail and exhibit the changes and appearance of the fish when taken from the lake The experiments of Mr Upton and Mr Parker corroborate in general what Mr Shaw has so successfully proved in Scotland, and are interesting as showing the change in colouring undergone by the Pinks at the period when the clear and silvery scaling is assumed, but beyond the time when the migratory change takes place we cannot depend upon the increase of weight or size Any one accustomed to see many Salmon in different states fresh from their native rivers, and to compare them with fish kept artificially, could at once say that Nos 4, 5, and 6 had been kept in fresh water, this is particularly evident in the form of Nos 4 and 5, and we would account for the comparatively fine condition of No 6 by the lake being newly completed, and unstocked (we presume) with other fish It is well known how much common Trout are influenced in their condition by being placed in a newly formed pond or lake The drawings by Mr C Curtis illustrating Mr Yarrell's paper were exhibited to the British Association at Newcastle, and were then much admired The coloured engravings from these now published, are executed with great minuteness and delicacy

Narrative of an Expedition into Southern Africa during the years 1836 and 1837, from the Cape of Good Hope through the Territories of the Chief Moselekatse to the tropic of Capricorn By Captain W C Harris 8vo Bombay, 1838 Murray, London (Reprinted) 1839

This volume may perhaps be thought by some scarcely to come

under the range of works which should be noticed in the 'Annals, but as the author tells us that "both from education and taste," he "possessed an ardent desire to contribute his mite to the geography and natural history of the countries" he "was about to explore, and that there are interspersed through the work anecdotes of several rare animals, which though not written for the naturalist are extremely interesting to him we have thought it worth while to bring it under the notice of our readers. Capt Harris seems to have been born a sportsman, possessing the bump of destructiveness in its fullest development. At a very early age (16) he received a commission in the army in India where he was 'entered' at the Lion and Tiger of the East but not satisfied with the gorgeous scenery and abundant game which this continent produced, hankering after the tales of travellers in the plains of Southern Africa, and considering that country as the "fairy land of sport" the "hunter's paradise," he took advantage of a banishment to the Cape of Good Hope by the Medical Board to project a realization of his young dreams of the interior, and having found a brother sportsman, they set out upon their expedition with a retinue of horses, oxen, wagons, and Hottentots for Graham's Town travel by Kuruman or New Litkoo to the residence of Moselekatse the Matabili chief, penetrate still northward to the river Limpopo, and return again to the colony by the route of the Vaal river. The volume is pleasantly written, and carries on both the sportsman and naturalist. Some of the descriptions of scenery are beautifully sketched and if some of the hunting scenes seem as if coloured with a sportsman's licence, and the rifle is used with Kentucky precision, we can excuse the enthusiasm which prompted the tale, and knowing the feelings which excite the comparatively puny European sportsman, who has hooked and mastered his first twenty-five or thirty pound Salmon, or sees his first red Deer fall in the glens of Athol or the wild forests of Ross, we can join with the "tingling excitement" experienced when galloping side by side with the 'Swan necked Giraffe,' and the "bursting exultation" when looking down on the first noble prize he had won.

To the naturalist the volume is interesting as detailing different traits in the habits of several of the rarer Antelopes. It confirms the remarkable manner in which many of the species are restricted, as it were almost by a line, within certain boundaries, and the incredible troops in which they migrate and are spread over the interior, where the arrows and pitfalls or traps of the natives, and the ravages of the larger *Felineæ* are as nothing compared with the

increase All these animals are said by Capt Harris to be easily overtaken by a good and well-conditioned horse, their very speed being their destruction, frantic terror at such novel enemies causing them to spend their strength in the exertions of a few miles The speed of the Camelopard is extraordinary, but "our best horses were able to close with him in about two miles"

The great fault of Capt Harris's book is a constant attempt to assume a scientific character, which every page contradicts There is no precise information on the subject either of zoology or geography, the two branches which the author particularly boasts of his desire to investigate, he does not appear to have made a single observation to ascertain either the latitude, longitude, or elevation of the places he visited, nor to have carried any instruments for that purpose, and this is the more to be regretted, as he visited a part of the country very seldom penetrated by Europeans The positions on his map are consequently laid down at least 20° wrong in latitude, and their longitude of course must have been taken at random Though not a practised zoologist, Capt Harris's hints on habits and localities are often valuable, and they are given but as incidental to the great thread of his discourse, which is a lively narrative of a shooting excursion and nothing more, but this very character deprives them of suspicion To the end of the volume is added a descriptive Catalogue of the Mammalia of Southern Africa but which contains little that was not previously known it is in fact chiefly copied (though without acknowledgement) from Dr Andrew Smith's "African Zoology," a small work printed at Cape Town about eight or ten years since, and we believe never published, though freely circulated among the friends of the amiable and talented author

We have thus attempted to give a fair and impartial account of Capt Harris's volume It is written in the lively dashing spirit of a soldier and a sportsman no one can read it without amusement and few without some instruction, and if truth has obliged us to mingle some slight censure with our general praise of the performance, it is because the pretensions which the author makes to scientific knowledge create expectations which are disappointed in the perusal

Deutschlands Lebermoose in getrockneten Exemplaren Herausgegeben von Dr J W P Hubener und C F E Genth 8vo Mainz Florian Kupferberg, 1836—1839 Nos 1 to 5

To such of our readers as are students or collectors of Cryptogamic plants, and we hope and believe that this class of botanists has

greatly increased of late in this country, we strongly recommend this collection of specimens of the Hepaticæ of Germany. Each number contains 25 specimens with the names and localities but unaccompanied with descriptions. As might be expected the great majority of the plants given belong to the genus *Jungermannia*, but specimens referred to the genera *Riccia*, *Marchantia*, *Anthoceros*, and others recently separated from these are also given, so that the collection may ultimately include as far as possible, all the species of Hepaticæ found in Germany. The specimens are good, and very well preserved.

A. Bertoloni Flora Italica sistens Plantas in Italia et in Insulis circumstantibus sponte nascentes. Bononiæ, 1833-39. 8vo.

We have recently received the first Fasciculus of the 4th volume of the above work which we must crave the pardon of our botanical readers for not having sooner introduced to their notice. It is quite unnecessary for us to say anything in praise of the high botanical attainments of Alot Bertoloni since they are universally allowed to have raised him into the first rank of modern botanists, a character fully supported by the work before us. It is the author's intention to describe all the plants indigenous to Italy and the adjacent islands, and this he has now done (in the first three volumes), as far as the end of Pentundria, in a more complete manner with fuller descriptions more numerous synonyms and with a greater number of critical and explanatory observations than we have met with in any other Flora. In the part commencing the fourth volume which is now more particularly under our notice the class Hexandria is commenced, and in order to convey some idea of the extent of the Flora, and the space devoted to the several species we append a list of the genera described in this fasciculus of 128 octavo pages and mark by the numbers following each name the number of species included in each genus — *Galanthus* 2, *Leucojum* 5, *Narcissus* 12, *Pancratium* 2, *Sternbergia* 2, *Allium* 31, *Itilium* 5, *Fritillaria* 3, *Erythronium* 1, *Tulipa* 8, *Ornithogalum* 12, *Scilla* 12, *Asphodelus* 5, *Anthericum* 4. In Sir J. E. Smith's 'English Flora' the corresponding genera occupy only 22 pages and include 24 species, in Bertoloni's work they occupy 128 pages and include 114 species.

We cannot too highly recommend this work to the notice of British botanists, more especially from its including (as far as at present published) nearly all the native plants of our own country and placing them in juxtaposition with the numerous allied species which are found in the south of Europe.

Verzeichniss der in Jahre 1832 im östlichen Theile der Altai-gebirges gesammelten Pflanzen Ein Supplement zur Flora Altaica, von Al v Bunge 8vo St Petersburg, 1836

This Supplement to the Flora Altaica is quite essential to all those who possess that excellent work It is extracted from the Mémoires de l'Académie de St Petersburg, and contains a catalogue, with numerous descriptions and observations, of the plants collected by M Bunge in the eastern part of the Altai Mountains in 1832 and notwithstanding its German title, is wholly written in Latin Many new plants are described, and fuller accounts given of species incompletely noticed in the Flora Altaica

Fungorum et Byssorum Illustrationes, &c By F Fulg Chevallier Fasc I With 52 coloured Plates Lipsiæ Strasburgi et Parisiis, 1837

This work contains many beautifully drawn and well-executed plates, especially of the larger Fungi The illustrations of the more minute species we think far less happy and they are extremely poor in anatomical details We find, too, more than one well-known species published as new

Pterodinia nivea is clearly *Isaria intricata*, var *subsimplex*, Schum

Fusisporium palustre has long since been published by Desmazière, under the name of *Psilonia Arundinis*, and it is described in the third volume of Fries

Psilonia Buxi, already placed by Fries in the genus *Fusisporium*, has a new specific name given to it

If we mistake not, *Æthidium melanum* is a state of *Licea cylindrica*, figured by Nees under the name of *Dermodium fallax*

A few other points of less importance might be noticed

With these exceptions the work may be pronounced as a beautiful contribution to the stock of Mycological illustrations, though it does not make any important addition to our knowledge of Fungi

Linnæa Vol XIII Part 3 1839

On the development of the spores in *Anthoceros laevis*, by Prof Mohl With a Plate — Appendix to observations on the hairs in the air-tubes of *Limnanthemum* and *Villarsia*, by Dr S F Hoffmann — Observations on American *Bauhinia*, by Dr Vogel — Synopsis of Scandinavian *Draba*, by Al Ed Lindblom — Notice of the continuation of Bartling and Hampe's *Vegetabilia Cellularia* by Hampe alone

British Coleoptera delineated, consisting of Figures of all the Genera of British Beetles drawn in outline By W Spry M E S , edited by W E Shuckard Lib R S Nos 1—6 To be continued Monthly, each Number containing Six Plates and Illustrating nearly fifty Genera .

This work, of which six numbers have regularly appeared, is adapted to serve as an illustration to the different works on the subject published without plates The figures of the insects are faithfully and correctly drawn, considering at the same time the low price at which they are published, scarcely three farthings a genus They are not indeed to be compared to the artistical plates of Curtis, but they are accurate enough to serve the purposes for which they are intended, and are executed in a style of lithography which we have not before seen employed in this country though much used on the continent for natural history publications, and are well adapted for the purpose of illustration

PROCEEDINGS OF LEARNED SOCIETIES

LINNAEAN SOCIETY

December 3 —Edward Forster, Esq , V P , in the Chair

The Rev W S Hore exhibited a specimen of a remarkable variety of Duck supposed to be hybrid between the *Anas Boschas* and *Anas acuta* of Linnæus

Read “ Descriptions of three Vegetable Monstrosities lately found at York ” By the Rev W Hincks M A , F L S

Two of these monstrosities occur in species of Iris, and much resemble each other The species are *I versicolor* and *I sambucina* They have 5 parts in each circle, except that the inner circle of petals consists of 4 in one instance and only 3 in the other It is sufficiently manifest that they are produced by the union of two flowers to form each, and they lead to the conclusion that when Irises with 4 parts in each circle occur (which are not very uncommon) they are unions of two flowers, one-third part of each having perished in the junction Various other monstrosities consisting in the union of two flowers were compared with the subjects of the description, particularly some of *Oenothera*, flowers having 7 petals, 14 stamens, and 7 stigmas, where the parts preserved in the union are in exactly the same proportion as in the Irises

The third specimen described as a monstrous union of 4 flowers

in *Scrophularia nodosa*. The flower-stalk may be perceived to be formed by the adherence of several stalks. The parts found are 15 sepals, 16 petals, 20 stamens, 2 separate ovaria, each with 2 carpels, and a third ovary formed by the adherence of 2 more, and consisting of 8 carpels. Explanations were attempted of the manner in which the union of 4 flowers would account for these numbers of parts. The increased developement of the circle of stamens 5 appearing for each flower, though of these several are united in threes together, and two are imperfect, and the increased number of carpels in two of the united flowers, are interesting facts. They show that the union of the flowers had the effect of diminishing and rendering more equable the pressure on the interior circles so as to allow of the growth of parts which are usually abortive.

There was also read, "A monograph of *Streptopus* with the description of a new genus now first separated from it. By D. Don, Esq., Libr. L.S. Prof. Bot. King's College."

The genus *Streptopus* was established by the elder Richard in Michaux's *Flora Boreali-Americana* and was intended to include, besides the *Uvularia amplexifolia* of Linnæus, which is to be regarded as the type, two other species, then entirely new to botanists, namely *S. roseus* and *lanuginosus*. The first is common to Europe and America, while the two last are confined to the latter continent. A fourth species, a native of Gosaingthan and Kamaon, was described under the name of *simplex* in the 'Prodr. Floræ Nepalensis'. The *lanuginosus* is considered by Professor Don as the type of a new genus, which he has named *Proartes*, and which is distinguished from *Streptopus* by its lengthened filaments, binary pendulous ovula, and terminal inflorescence. In *Streptopus* the filaments are short with erect sagittate anthers, the cells of its baccate pericarpium are polyspermous, the seeds erect, and the flowers are axillary and solitary. Both genera belong to the *Smilacæ*, and serve to connect that family with *Melanthacæ*. The characters of the new genus and of the species belonging to both are here subjoined —

- 1 *S. amplexifolius* (Lam. et DeCand. Fl. Franc. 3 p. 174), glaber, pedunculis medio convolutis appendiculatis, sepalis obtuse acuminatis, antheris sagittatis acuminatis, stigmate trilobo, baccæ loculis 6-spermis.
- 2 *S. roseus* (Michx. Fl. Bor. Amer. 1 p. 201), hirtellus, foliis ciliatis, pedunculis recurvatis subbifloris, sepalis lanceolatis acuminatis, antheris bicuspidatis filamentorum longitudine, stigmatibus stylo 6 plò brevioribus, baccæ loculis 4—6 spermis.
- 3 *S. simplex* (Don, Prodr. p. 48), glaber, pedunculis rectis nudis, se

palis obtusis, antheris cordato lanceolatis obtusis, stigmatibus styli sublongitudine, baccae loculis 10—12 spermis

PROSARTES

Streptopis sp, Mich

Perianthium 6-phyllum, petaloideum, campanulatum, æquale, deciduum foliolis basi foveolatis v saccatis. *Stamina* 6, basi sepalorum adnata, simulque decidua. *Antheræ* erectæ, innatæ, obtusæ, biloculares, rima duplici marginali longitudinaliter dehiscentes. *Ovarium* liberum, 3 loculare. *loculis* bivulatis. *ovulis* obovatis, a placentæ apice pendulis. *Stigmata* 2, brevissima, recurvata. *Pericarpium* baccatum, 3 loculare. *Semina* solitaria, v rarius binaria.

Herbæ (Americæ borealis) perennes, pubescentia ramosa vestitæ, rhizomate diviso multiceps. Cules teretiusculi. Folia sessilia, dilatata. Inflorescentia terminalis, umbellata. Baccæ rubra.

- 1 *P. lanuginosa*, umbellis bifloris sessilibus, sepalis lanceolatis acuminalis 3-nerviis basi foveolatis, stylo glabro, foliis cordato-ovatis subamplexicaulibus utrinque pubescentibus.
- 2 *P. Menziesii*, umbellis sessilibus bifloris, sepalis oblongis mucronatis 6-nerviis in æne revolutis basi saccatis, stylo longissimo piloso, foliis ovatis sessilibus glabrescentibus.

This new species is a native of the north-west coast of America where it was first found by Mr Menzies in the voyage of discovery under Vancouver, and it has been very properly named in compliment to that venerable botanist.

The plant bears a close resemblance to some species of *Disporum*, and it moreover agrees with that genus in its sepals being produced into a short spur or pouch at their base. The flowers are considerably larger than those of *lanuginosa* and they are apparently of a yellow colour. The style is long and copiously hairy. The genus is essentially distinguished from *Disporum* by its innate anthers, nearly concrete styles, and pendulous seeds.

ZOOLOGICAL SOCIETY

March 12, 1839 — William Yarrell, Esq, in the Chair

Mr Ogilby communicated a portion of a letter which he had received from M Temminck. It related to two species of Monkeys, *Colobus fuliginosus* and *Papio speciosus*, the former M Temminck considers identical with the Bay-Monkey of Pennant and he states that this opinion is founded upon its agreement with a coloured drawing now in his possession, this drawing having been taken by Sydenham Edwards from the specimen of the Bay Monkey

formerly in the Leverian Museum, and which is the original of Pennant's description

The *Macacus speciosus* of M F Cuvier is stated by M Temminck to be founded upon an immature specimen of a species of *Macacus* which inhabits Japan, the habitat of Molucca Islands given by M F Cuvier being founded upon error. The specimen was originally taken from Japan to Java, where it died, the skin was preserved, and M Diard having obtained possession of it, sent it to the Paris Museum, and as there was no label attached, M F Cuvier imagined it to be a native of the place whence M Diard had sent it.

Mr Fox exhibited several birds, which he stated had formed part of an extensive collection made in Iceland by the Curator of the Durham Museum.

May 14, 1839 — Sir John P Boileau, Bart, in the Chair

The Rev F W Hope exhibited a portion of his collection of insects, in order to illustrate a paper entitled 'A Monograph on Mr William Sharp MacLeay's Coleopterous Genus *Euchlora*'

Genus EUCHLORA, MacLeay

MELOLONTHA, Linn, Fab & Olivier

Antennæ articulis novem, basilarum conico elongato, 2do, 3tio, 4to, 5to et 6to brevibus subglobosis, capitulo ovato, triphylo, elongato, antennarum longitudinis totius haud dimidium æquante

Labrum prominulum, clypeo fere absconditum, margine antico lineari, ciliato, emarginato, lateribus rotundatis

Mandibulæ latitantes, subtrigonæ suprâ planæ, latere externo rotundato, interno ciliato, ad apicem 3-dentato

Maxillæ caule subtrigono-triquetro, ad apicem inflexæ 6-dentatæ

Palpi maxillares articulo terminali cylindrico ovato

Labiales articulis 2do et ultime longitudine æqualibus hoc subulato

Mentum subquadratum, margine antico emarginato angulis truncatis rotundatis ac lateribus sinuatis, posticè valdè convexis

Caput subquadratum clypeo lateribus rotundatis margine reflexo

Corpus ovatum convexum posticè elytris haud opertum *Thorax* subquadratus ad basin duplo longior quam latior, latere postico sinuato vix lobato

Scutellum parvum cordato-truncatum *Sternum* haud productum

Pedes validiusculi tibus anticis 3-dentatis *Tarsorum* ungues

posticorum indivisi reliquorum ex unguibus unus bifidus, alter indivisus

‘ It is in the warm and tropical regions of the world that we find vastness one of the leading characteristics of animal life. It is in the same regions also, amongst the class of insects, that we find a corresponding magnitude attended with a wonderful increase of species many examples of which might here be mentioned. It is sufficient for our purpose at present to note only a few of them, such as the *Sternocera*, among the *Buprestidae*, *Lamia*, belonging to the Longicorn beetles, and *Melolontha* and *Euchlora*, well-known genera pertaining to the Lamellicorns. With regard to vegetation, there will also be found an equal magnitude of stature and a luxuriance of foliage quite in proportion to what occurs even in the animal world. If we look to the tropical regions of Asia, Africa, and America, we shall find a similarity of character generally predominating but it is in the tropical jungle chiefly, and on the banks and estuaries of mighty rivers, that insects will be found, not only formidable by their size, but remarkably numerous in species and individuals. The genus *Euchlora* of Mr MacLeay, to which at present I wish to draw your attention, is not very distinguished for its size, although larger than all the allied genera belonging to the family. The predominating colour is green, and the abundance of individuals belonging to some of the species is incalculable. I may mention, *en passant*, that the thousands which have annually been imported into Europe, appear from inquiry not in the least to have thinned their numbers. On one occasion I received forty Chinese boxes, and in each of them (I speak greatly within bounds) there were at least twenty specimens of *Euchlora viridis*. These boxes are imported into England, and other parts of Europe, in great quantities and there is scarcely a museum at home or abroad, however insignificant it may be, but exhibits its Atlas Moths, its purple-coloured Sagra, and less attractive *Euchlora*, in tolerable profusion. I have stated above that the prevailing colour of the species is green, but there are some exceptions. The under side of some of them is usually a bronze, or a rose-coloured copper, some of them green above and beneath, others green above and yellow beneath, while some again are blue on the same side, with the play of light appearing of a violet colour. With regard to the colour of insects, greens, as far as my observations go, naturally on one side merge into blues and violets, and on the other into orange and yellows. Instead of occupying the time of the meeting with a question at present (as far as regards insects) comparatively little studied or understood, I pro-

ceed to remark on the geographical distribution of the family *Euchloridæ*. Had some of the Continental entomologists been better acquainted with Mr MacLeay's *Horæ Entomologicæ*, they certainly never would have considered *Euchlora* as an European genus. In a late work, published in Paris the "*Histoire Naturelle des Animaux Articulés*" (at page 135) we find under the generic name *Euchlora* not only *Mimela* and *Aprosterna* included, but also *Anomala* &c. It is singular that the same appellation is given to twenty two species therein specified a short analysis of which I now place before you and shall then allude more particularly to the genera composing the family the range over which it extends and mention the countries and localities in which they severally occur.

Of the above twenty two species, five of them appear to be true *Euchloræ* two others belong to *Mimela* Kirby another to *Rhombonyx* Kirby and the remaining fourteen to *Anomala* of Megerle as it now stands. Before I conclude these remarks on the species of the genus before us it is necessary to state that I have elevated *Euchlora* to the rank of a family, the following genera properly belonging to it

EUCHLORIDÆ, Hope

Genera	Country	Species known
1 <i>Euchlora</i> , <i>MacLeay</i>	Asia	30
2 <i>Aprosterna</i> <i>Hope</i>	Asia and Africa	5
3 <i>Mimela</i> <i>Kirby</i>	Asia	22
4 <i>Rhombonyx</i> <i>Kirby</i>	Siberia and China	2
5 <i>Anomala</i> , <i>Megerle</i>	Old and New World	120

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Genus 1 EUCHLORA

"The family of *Euchloridæ* from the above table, consists of five genera and nearly two hundred species which have fallen under my notice. True *Euchlora* I state, belongs exclusively to Asia and its isles. It occurs as far south as Manilla appears at Singapore, and runs from thence through the continent of India up to the Himalaya, the extreme eastern point appears to be Japan, while its western range does not reach Bombay, probably from the intervention of some physical barrier. Captain Ezia Downes has taken it at Neemuch. The Entomology of that district essentially agrees in character with that of Calcutta and Madras, at the latter of which places *Euchlora* is taken.

Genus 2 APROSTERNA

"This genus is not peculiar to Asia, as some of the species are found in New Guinea.

Genus 3 MIMELA .

' This elegant genus rivaling in colour and splendour the *Buprestidae*, is confined to Asia, it ranges wherever *Euchlora* is found

Genus 4 RHOMBONYX

" This genus is probably peculiar to Asia . One species is found in China, and the other, I have reason to think, is only found in Asiatic Siberia

Genus 5 ANOMALA

' Anomala is common to the four quarters of the globe and may properly be divided into three if not four subgenera, which task I willingly leave to other entomologists

In concluding these observations on *Euchlora* I have only to add that it may excite some surprise that this genus extends far into the Himalayan regions it may be explained however satisfactorily by the influence of local causes . It is an ascertained fact, that tropical vegetation often extends into high latitudes, and why then may we not expect to find insects which feed upon it, and are intended probably to keep it within due bounds ?

From information given to me by my friend Professor Royle, I state that the tropic girt base of the Himalayas is characterized by a vigorous and luxurious vegetation

In the same regions there is also an uniformity or great equality of temperature well adapted for animal as well as vegetable life . The exuberance of the latter adds to the humidity of the atmosphere, as well by the exhalation of the foliage as by preventing free evaporation from the soil . In the boundless forest and interminable jungle there will generally be found a great equality of temperature, brought about in consequence of the umbrageous shelter impeding the absorption of heat by day as it checks the free radiation of it at night . It is then owing to the presence of tropical vegetation, united with moisture, that there arises considerable uniformity of temperature, in a word, it is from local causes that we are enabled to explain the reasons why we meet with the representatives of tropical genera of plants and insects extending into higher latitudes than at first might naturally be expected '

Sp 1 EUCHLORA VIRIDIS, Fabricius

Long lin 12, Lat lin 7

E glabra, punctata, supra viridis nitens subtilis cupreo-aurata, pedibus cupreis . Sternum laud porrectum

Vide Oliv Mel Tab 9 fig 21^b

Hab in Chinâ

Varictus *L elytris cupreo marginatis corpore supra aeneo marginato, antennisque piceis*

This species is found also at Singapore, Assam, in Bengal, and in the island of Ceylon. On the under side it is of a rose coloured copper appearing about the sternum and the lower rings of the abdomen of a brassy vivid green.

Sp 2 EU JURINII, MacLeay

Long lin 11, Lat lin 6

E. nitidissima, glabro-punctata, suprè viridi olivacea, subtùs viridi-cuprea, thorace utrinque punctis duobus impressis, pedibus viridibus, nitidis

Antennæ piceæ 7mo articulo virescente. Totum corpus suprè viride, aureo opalino colore tinctum, infra viridi-æneum, pedibus supra et infrà viridibus

Hab in Java, Mus Dom MacLeay

"I have received this species from Java, it varies in size, and may at once be distinguished from *E. viridis* by its smooth upper surface, which is of an opalescent bright green, its under side is also more brilliant, and of a golden-coloured bronze, the tibia and tarsi are invariably green. The *E. MacLeayi* of Mr Kirby's MSS is only a large variety of this species."

Sp 3 EU CUPRIPES

Long lin 12, Lat lin $6\frac{1}{2}$

Affinis Euchl. viridis, MacLeay at major. Corpus ovatum, supra viride glabrum subtùs roseo cupreum pedibus cupreis

"This insect is closely allied to *E. viridis* MacLeay, it is, however distinct. *Viridis* in form is oval. *Cupripes*, ovate the under side is of a rich rose coloured copper, without anyaneous tinge. I have received one specimen from Java, and a second from the Ienasserim coast."

Hab in India Orientali Mus Dom Hope

Sp 4 EU GRANDIS

Long lin 14, Lat lin 8

E. glabra punctata supra viridis, nitens, subtùs viridi-cuprea, thorace utrinque puncto laterali medio leviter impresso, pedibusque viridibus

Hab in Calcutta? Mus Dom Hope

"I obtained this species from Calcutta, I am doubtful, however, if that be its real habitat. It is stuck with a needle like most of the Chinese insects, and may have been imported into Calcutta. It is at present the largest species of *Euchlora* I am acquainted with."

Sp 5 EU MACLEAYANA, Vigers

Long lin $1\frac{3}{10}$, Lat $\frac{9}{10}$

E. pallide virescens, capite thoraceque punctis aureis confertis splendentibus, elytris punctatis flavo-marginatis, corpore subtùs pedibusque aureo-cupreis

Antennæ aureo-cupreæ. Corpus subtùs pedesque aureo-cuprei, albidè pilosi. Clypeus aureus. Scutellum nitidum, parcè punctatum

Hab in India Orientali In Mus Dom Vigers

"It is difficult to convey, either by description or representation, a just idea of the beauty of this superb insect, which was obtained

from Madras It was named by Mr Vigors in honour of Mr William Sharp MacLeay "

Sp 6 EU SMARAGDINA, Eschscholtz

Long lin $11\frac{1}{2}$, lat lin $5\frac{1}{2}$

E. suprà viridi-orichalcea, subtùs, femoribus, thoracis pygidique marginibus externis fusco auratis, capite thoraceque densè punctulatis, elytris vagè punctulatis seriebusque punctorum plurimis

Hab in Insula Luzonum, Manilla

"The above insect I received from Dr Eschscholtz* "

Sp 7 EU SIEBOLDII

Long lin $10\frac{1}{2}$, lat lin $6\frac{1}{2}$

Affinis præcedenti, glabra punctata, supra viridis, thoracis lateralibus marginibus fusco auratis Pygidium viridi cupreum Corpus infra roseo cupreum, et nitidum Pectus subargenteum sericeum obsitum Pedes supra virides, subtus cupreo aurati, femoribus cupreis et nitidis

Hab in Madagascariæ Captus celeberrimo Macklotio

This species is allied to *E. smaragdina* of Eschscholtz but may at once be distinguished by the different colour of the *pygidium*, that of *smaragdina* being of a brilliant gold colour "

Sp 8 EU ALBO-PILOSA, Siebold

Long lin 10, lat lin 5

E. glabra punctata supra viridis subtùs roseo cuprea et nitida albo-pilosa, femoribus tibus tarsisque concoloribus (caput viride antennis fusco-piceis margines thoracis aurato virides Scutellum postice cupreum Elytra lineis longitudinalibus impressa, sutura læte viridis, marginibus e medio elytrorum ad apicem fusco-membranaceis Corpus infrà roseo cupreum, albo-pilosum Pygidium viride et tomentosum Pedes cuprei

Hab in Japoniâ

"This singular insect was sent to me by my friend De Haan of Leyden It is remarkable for a dilated margin to the elytra, which appears to be membranous The pubescence also of this species is singular "

Sp 9 EU MARTINII, Kirby's MSS,

Long lin 10, lat lin $5\frac{1}{2}$

E. viridis, capite marginibus thoracis auratis, elytris lineis duabus longitudinalibus fortiter impressis Pygidium viridi cupreum Corpus infrà roseo-cupreum, femoribus nitidis

Hab in Chinâ?

"This insect is evidently distinct from any species yet described, it is in a very mutilated state, no tibiae and tarsi remaining It is described from the Rev William Kirby's collection, liberally given to the Entomological Society by that able naturalist "

Sp 10 EU BICOLOR, Fab

Long lin 9, lat lin. 5

* It has been reported that the above entomologist died of cholera it appears however that he died of a bilious fever

Caput viride, margine clypei rufescente antennis rubro fuscis, glabra suprà viridis, subtùs testacea, pedibus apice aureis Statura Euphoræ viridis at duplè minor suprà tota viridis, glabra, obscura, immaculata subtùs obscurior, testacea, æneo colore tincta femora pallidiora tibiæ et tarsi aurati, (Fab) pygidio obscure viridi Variat colore suprà viridi nitido, subtus aereo, et elytris interdum apice rufis

Hab in Java

Fabricius described this insect from Sir Joseph Banks's cabinet as a species from the Cape of Good Hope Olivier copied the error and figured one specimen, as obtained from the island of Bourbon Both writers are in error as to locality as the insect is peculiar to Java and the East Indian continent Mr Kirby has named the above species in his collection *E. Brightwelli* which I regard only as a synonym of *E. bicolor*

Sp 11 EU PERPLEXA

Long lin 8 lat lin $4\frac{1}{2}$

L. glabra, suprà viridis, subtùs pallide testacea tibus tarsisque roseo cupreis Affinis præcedenti at minor Caput viride margine antico subrufo, antennis testaceis Corpus suprà viride, glabrum subtùs testaceum femoribus concoloribus, tibus tarsisque roseo cupreis, pygidio viridi postice flavescens

Hab in agro Nepalensi

'This species I received from my late lamented friend General Hardwicke and for a long time I regarded it as the true *bicolor* of Fabricius Professor De Huan of Leyden has lately sent me *E. bicolor* Fab, from the island of Java I have therefore been obliged to name an insect which I regarded as previously described The species are closely allied and might have puzzled any individual The concise descriptions of Fabricius necessarily lead to error It is of the highest importance, then, to obtain authentic specimens from sources which may be relied on, and I feel satisfied, that with regard to insects unless the few authentic cabinets known are carefully inspected, little reliance can be placed on specimens without they are named from comparison "

Sp 12 EU FEMORALIS

Long lin 7 lat lin 4

E. glabra suprà viridis, subtùs rufo testacea, femoribus flavis Affinis E. bicolori at minor Clypeus æneo-flavescens Antennæ testacæ Thorax marginibus lateralibus concoloribus Elytra suprà viridia, opalino, seu aereo colore tincta, apice bituberculato Corpus subtùs testaceum Pectus sericie flavo obsitum Femora flava, tibus, tarsis, chelisque roseo-cupreis

Hab in Java

'This species, by the kindness of Dr Horsfield, I have described from the rich collection at the India House It approaches in form the genus *Mimela*, Kirby It is remarkable for its opaline play of colour, differing in that respect from all the species of my acquaintance "

Sp 13 EU DE HAANI

Long lin $11\frac{1}{2}$, lat lin 6

E viridis, suprà glaberrima nitida, subtùs æneo-viridis, nitido splendore conspicua Caput viride, in medio aureo colori tinctum Elytra glaberrima, sub lente vix subpunctata Corpus infra smaragdino colore ornatum, lateribus pectoris argenteis pilis obsitis, segmentis abdominis utrinque pilosis et punctatis Femora nitida, tibus fortiter variolosis, tarsi chelisque viridibus

Hab in Assam

‘ I have named this species in honour of my friend Professor De Haan of Leyden, to whom European entomologists are greatly indebted for the additions made to many of their cabinets ’

In Mus Dom Hope

Sp 14 EU DIMIDIATA

Long lin 11, Lat lin $6\frac{1}{2}$

E suprà tota viridis punctata, subtùs cyanea Vide Gray’s Zoological Miscellany, page 23 sp 8 under *Euchloria dimidiata*

Clypeus rotundatus, antennis, palpisque piceis Thorax subtilissimè punctatus Elytra viridia opalino colore tincta, glabra nitida, striato punctata strus parùm distinctis Corpus infrà cyaneum, violaceo colore mixtum Pectus pilis flavescentibus obsitum Pedes cyanei

Hab in agro Nepalensi

This species was originally described by me among other *Coleoptera* belonging to General Hardwicke’s superb collection which has passed since his death to the British Museum ’

Sp 15 EU SUICATA

Long lin 10 Lat lin 6

E suprà viridis punctata, elytris lineis fortiter sulcatis, corpore infra cyaneo

Caput viride Antennæ piceæ Thorax utrinque in medio puncto impresso Elytra binis lineis longitudinalibus fortiter impressa seu sulcata tertia fere humerali ante medium disci interrupta Corpus subtùs cyaneum pedibus concoloribus Pectus ferrugineis capillis sparsim obsitum, annulis abdominis, pedibusque punctatis

Hab in agro Nepulensi

‘ I received this insect from my lamented friend, Gen Hardwicke, and described it concisely some years back in Gray’s Zoological Miscellany

Sp 16 EU SUBCYRULÆA

Long lin 10 Lat lin 5

Totum corpus suprà et infrà subcyaneum Antennæ fusco piceæ Caput subquadratum Oculi nigri inde pallenti Thorax punctatissimus Elytra substriato-punctata apice tuberculato Corpus infrà concolor Pectus cum femoribus flavis capillis obsitum Tarsi chelæque piceæ

Hab in Javâ

“ This singular species I am enabled to describe through the kindness of Dr Horsfield, of the India House, who has liberally allowed

me to describe some of the nondescripts of the Company's collection "

Sp 17 EU CUPREA SIEBOLDII

Long lin $11\frac{1}{2}$, Lat lin $5\frac{1}{2}$

Caput clypeo subreflexo oculis nigris Totum corpus suprà æreum subtùs roseo-cupreum, nitidum Caput et thorax punctulata Elytra fovea impressa, obsolete striata punctulata lincis vix distinctis tuberculis apice conspicuis Pygidium deflexum pilisque aspersum Corpus infrà roseo-cupreum nitidum capellis subflavis obsitum

Hab in Japoniâ

" This insect I received from Professor De Haan, of Leyden with Siebold's name of *cuprea* attached to it, which I have consequently adopted "

Sp 18 EU CANTORI

Long lin 10, Lat lin $5\frac{1}{2}$

Affinis præcedenti at minor Caput antice rotundatum antennis piceis, oculisque albis Totum corpus suprà æreum, subtùs roseo-cupreum, coloreque virescenti tinctum Caput et thorax subtilissimè punctulata Elytra ærea, obsolete striata creberrimè punctulata Corpus infra roseo-cupreum femoribus anticis piceo rubris, colore nitidis, tibus tarsis chelisque cupreis

" This species inhabits Assam, it was given to me by Dr Cantor, in whose honour I have named it* "

Sp 19 EU COSTATA, De Haan

Long lin $8\frac{1}{2}$, Lat. lin $4\frac{1}{2}$

E ærea, thorace viridi, elytris costatis, corpore subtùs roseo cupreo Caput viridi-auratum antennis flavis oculisque albis Thorax auratus viridique colore tinctus, longitudinali lined media fortiter impressa, crebrè punctulatus Elytra roseo cuprea, sutura elevata, lineisque quatuor in singulo elevatis, interstitis punctulatis Pygidium flavum, in medio roseo cupreum, æneo subpunctatum Corpus infrà concolor, marginibus thoracis utrinque flavis

Hab in Japoniâ

" This species was sent to me by Professor De Haan, of Leyden, it verges from the typical *Euchloræ*, and appears intermediate between *Euchlora* and *Anomala* There is a variety of the above species which has the margins of the thorax yellow, and the elytra testaceous as well as its under side and feet yellow It is probably only an immature specimen "

Sp 20 EU AUREOLA

Long lin 8, Lat lin $4\frac{1}{2}$

E aurato-viridis glabra nitida corpus subtùs subtestaceum femoribus flavis, tibus tarsisque roseo-cupreis

Caput viride, antennis testaceis, oculisque fuscis Thorax et elytra subtilissimè punctulata virescentia auratoque splendore nitentia, marginibus posticis abdominis membranaceis Corpus infrà testa-

* " The superb collection of drawings of *Reptilia*, made by Dr Cantor whilst in India, is now deposited in the Radcliffe Library at Oxford it is to be hoped the University will publish them

*ceum viridiæneo colore tinctum Femora pallidiora tibus tarsis ch-
lusque roseo-cupreis Pygidium obscure viride et punctulatum*
Hab in Indiâ Orientali

" This beautiful species came from the Burmese territories , it ap-
pears to be unique "

Mus Dom Hope

SPECIES DUBIÆ

Sp 21 EU ÆREA, Perty

Long lin 6 , Lat lin $4\frac{3}{4}$

*E brunneo-ænea, thorace subtilissimè punctulato elytrisquæ obsoletè
striatis rugulosis*

*Staturd et magnitudine fere E Frischii, aliquantulum angustior
Tota brunnea æneo-micans Caput et thorax subtilissimè punc-
tulata Scutellum disco impresso Elytra irregulariter punctato-
striata, rugulosa*

Hab in Javâ

" I am in doubt if this insect can be considered as an *Euchlora*,
being compared with *Anomala Frischii* , it may probably belong to
that genus '

Sp 22 EU CICATRICOSA, Perty

Long 7''' , Lat lin $3\frac{1}{4}$

*L ænea elytris castaneis, cicatricoso-punctatis Caput cupreo-æneum,
punctulatum Thorax æneus densè punctulatus, stria media lævi
impressa Scutellum viridi æneum, punctulatum Elytra castanea,
marginulo extremo æneo, substriato-punctata, punctis confluentibus
cicatricosis Antennæ et trophi piceæ subtus cum pedibus ænea*

Hab in Brasiliâ Australi, Prov S Pauli

' I am totally unacquainted with the above insect , I have given the
description from the *Delectus Animalium Articulatorum*, the ento-
mology of which was written by Professor Perty I feel no hesi-
tation in referring the above species to another genus, as I do not
believe a true *Euchlora* is ever found in the New World '

Sp 23 EU IRRORELLA, De Haan

Long lin 7 , Lat lin 4

Punctuce, d'un brun-jaune clair, avec deux bandes longitudinales
sur la tete, plusieurs autres mêlées sur le corselet, et une foule
de petites taches transversales sur les élytres, noires , dessous du
corps et pattes tachetés de noir Java

" From the above description it appears probable that *Irrorella* be-
longs to the genus *Euchlora* "

Sp 24 EU ? STRIGATA, Castelnau

Long lin $7\frac{1}{2}$, Lat lin 5 .

D'un beau vert métallique, cuivreux, très brillant , bords latéraux
du corselet d'un brun-jaunâtre métallique, avec un point vert au
milieu , élytres avec des stries de points enfonces, serrés, d'un
brun-jaune clair, à reflets verts métalliques, avec plusieurs
taches de cette couleur à la base, sur le milieu et à l'extrémité ,
plaque anale jaunâtre, avec deux grandes taches d'un vert mé-
tallique sur les côtés

Hab Coromandel

"This and the foregoing species are described from a French work now in the course of publication, by the Count de Castelnau "

Sp. 25 EU TRIVITTATA, Perty

Long lin 5, Lat lin $2\frac{1}{4}$

Subtùs testaceo-metallica, thorace viridi, margine stridque medià flavis, elytris testaceo viridibus

Statura omnino E I rischii, sed satis minor Subtùs testacea metallico-nitida, abdomine obscuriore Caput æneum, subtilissimè punctulatum, clypeo reflexo Thorax viridi æneus, nitidus, margine laterali lato, vittâque mediâ flavis Scutellum viridi æneum, politum Elytra longitudinaliter punctulata, testaceo-viridia Antennæ brunneæ Pedes metallico testacei

Hab in Javâ

In Museo Dom Perty

Sp 26 EU SPLENDENS Schonherr

Suprà glabra, viridi orichalcea, nitidissima, thorace elytrorumque dorso subtiliter parce punctulatis clypeo reflexo integerrimo

Hab in China

In Museo Dom Schonherr

"It is probable that the above species is a *Mimela* It is considered by Professor Perty to be an *Euchlora* I have added Schonherr's short Latin description, for more ample details consult the Appendix to Schonherr's 'Synonymia Insectorum,' tom 1, part 3, page 110 "

Besides the above twenty-six species of *Euchlora*, there are several other insects which have been comprehended under that name, for instance *E Dalmanni* of Schonherr, and *Chrysca* of Kollar both of which are true *Mimelæ*, and allied to *M fastuosa*, Fab, and to these may be added various species of *Anomala*, recorded by Fabricius De Jean and others The latter writer, in his last catalogue of 1837, mentions the names of *E pligera Japonica, chalcites* as he, however, confounds *Mimela* with *Euchlora*, little reliance can be placed on his authority, they are, moreover, manuscript names and no names ought to be adopted without published descriptions I may add that in the Dutch and other collections, about six others have fallen under my notice, making in all about thirty species, which number no doubt will be considerably increased the more we become acquainted with the Entomology of Oriental India

ROYAL SOCIETY OF EDINBURGH

Dec '16 — Sir Thomas M Brisbane, Bart President, in the Chair

The first paper of the evening was an account of experiments on the development and growth of Salmon, from the exclusion of the ovum to the age of two years By Mr Shaw, Drumlanrig This communication formed the sequel of a former one read to the Society in December 1837, and continued the account of Mr Shaw's expe-

riments during the intervening period. These valuable observations merit a more ample detail in our pages, meanwhile, however, we supply but a few hasty hints.

In some prefatory remarks, Mr Shaw met an objection to the inferences from his published investigations, proceeding from respectable authority and which resolved itself into considerations connected with the small size and artificiality of his experimental ponds. Mr Shaw repelled this by stating that the ponds were made the channel of a copious stream, that the body of running water they contained was very considerable, that the supply of the insects, &c which constituted the food of the young fish was abundant, and that these little creatures were in as good condition as their congeners in the neighbouring river.

Mr Shaw's former observations led to the conclusion that the Parr is nothing else than the proper fry of the regular salmon. In his former paper, his experiment was carried thus far — salmon engaged in the process of reproduction were caught in a net, a particular spot of the running stream was selected, from this spot a channel was formed which communicated with a small pool, fit to become a temporary spawning bed, into this selected spot the adult female salmon was introduced, by gentle pressure on her sides the roe was made to flow freely from her body, this swam down the artificial channel, and was deposited in the temporary bed. Precisely the process was repeated with the adult male, whose milt followed the same course, and settled in the same pool. Portions of the ova thus impregnated were removed into the experimental pond No 1, which, as formerly explained, was quite separate from the river and isolated from all accidental contamination. These were carefully watched and found to become genuine parr.

Strong additional circumstances have occurred within the last two years, which have greatly confirmed the inference which naturally flows from the above occurrence. One of these is connected with the subsequent history of the little fish alluded to as placed in pond No 1. The brood has been watched, and Mr S has found that a very few at the close of the first year, and the whole before the end of the second, exchanged their well known primary river livery of parr, for the silvery migratory coat of the young salmon. With this change in appearance, a great change in their habits occurred. The so-called parr in the pond were solitary and quiet, and if a neighbour invaded their habitual retreat, he was speedily expelled from the forbidden ground. On assuming the migratory dress, the habits of the whole family became much more active, they freely associated

together, and seemed restlessly disposed to escape from the limits of their confinement

Another still more confirmatory circumstance is the following It had long been noticed that the young parr of the second year was a not less constant attendant upon the adult female salmon when depositing her spawn than was her own mate, the milt flowing abundantly from his body, and for no other apparent purpose than the impregnation of the salmon's roe,—no female parr in similar circumstances ever being detected This fact led Mr Shaw to the inference, that however different the age of these two fish, yet the union could arise from nothing but identity of species and he therefore subjected to precisely the same experiments as those above described, the roe of the adult female salmon, and the milt of the tiny parr Portions of the spawn thus treated were put into the artificial pond No 2 It proved to be impregnated, the produce during the first year having all the appearance of true parr toward the end of the second year they assumed their silvery hue, and in fact the young fish in pond No 2 underwent precisely the same changes as those of No 1 Nor was this a hybrid race, for one of these of the second year was again made the subject of experiment with the adult female salmon, his milt being brought into contact with her roe and this new progeny appeared identical with those already noticed Specimens were exhibited to the Society of the parent adult salmon, male and female, and of some of the young of the ponds, killed when they had the regular markings of the parr, and afterwards when they had assumed the migratory dress of the young salmon

In the conversation which followed, Professor Christison stated that, along with Mr Shaw, he had personally examined and could confirm the accuracy of every one of the author's statements, both in the previous communication and the present Mr James Wilson likewise offered some remarks, insisting particularly upon the fact that the specimens before the Society demonstrated that these fish had, at one period of their existence, all the genuine characters of true parr, and indisputably were the parr of the naturalist and the angler, and were as certainly at a subsequent period transformed into the young salmon, and Professor Traill closed the discussion by avowing, that although from some anatomical details there had long existed in his mind difficulties in the way of arriving at the same conclusion with the author, yet he could not withstand the evidence he had just heard, that he was a convert to Mr Shaw's opinion, and that he considered his communication as one of the

most important contributions that had of late years been made to Natural History, both in a scientific and commercial point of view

BOTANICAL SOCIETY OF EDINBURGH

This Society met on the evening of the 14th November, in the Royal Institution —Dr R K Greville in the Chair

A letter from the Marquis of Normanby was read, stating that the Diploma of the Society had been laid before the Queen, and that the same had been very graciously received by Her Majesty A letter was also read from Baron Werther, inclosing a communication from the King of Prussia, in which His Majesty was graciously pleased to acknowledge the receipt of the Society's Diploma, transmitted on the occasion of His Majesty's election as an honorary member

An account of botanical excursions made from Edinburgh in the autumn of 1839, was read by Professor Graham

Mr Forbes read a notice of excursions in the neighbourhood of Trieste*, in which he gave a sketch of the Triestine territory, a country exceedingly rich in rare and curious plants The excursions described were four —1st, the immediate neighbourhood of the town 2nd, the salt marshes of Zaule, and the neighbouring hills of Istria, 3rd, the Monte Spaccato and the wood of Lipizza, on the singular calcareous plain of the Karst and 4th, Contobello on the sea coast

Dr Greville laid on the table a series of specimens of *Quercus robur*, exhibiting an extraordinary range of form From the singular variation exhibited by these specimens in the shape and texture of the leaves and in the length of the peduncles, Dr Greville was of opinion that there is but one species of oak indigenous in Britain

ROYAL PHYSICAL SOCIETY OF EDINBURGH

Of the communications read this Session to the Physical Society, we notice the following —Edward Forbes, Esq exhibited drawings and diagrams of the various genera of *Ciliograde Medusæ* inhabiting the seas of Britain, with comments on their structure and habits He gave an account of two new species of *Alcinæ*—a genus observed this summer, for the first time,* in the northern hemisphere, also, of a new *Beroë*, discovered near the Isle of May, and concluded with some interesting observations on the structure and use of cilia, which naturalists have generally supposed are for motion, but which Mr Forbes showed could not be so

* See p 307 of our present Number

MISCELLANEOUS

ON DIFFERENT TISSUES THE WORK OF INSECTS

In the 'Compte Rendu' of the sitting of the Academy of the 19th August of this year, there is an extract from a letter of M. Levasseur, who forwarded a piece of a very fine tissue a kind of cloth made by caterpillars, which was found in Moravia. This extract has occasioned two other communications on similar facts the one observed by Count Saumeray, near Blois, the other by M. Delahaye librarian to the city of Amiens.

Reaumur in the second volume of his Memoirs mentioned the caterpillars which make these tissues. They are the species of Moths which entomologists have included in the family *Yponomeutidæ*, a name meant to indicate the habits of these caterpillars which live congregated together in vast numbers under a common tent, and which when they remove weave for themselves galleries or covered ways, in order to be sheltered and to escape the too strong light and heat of the sun, and at the same time thus preserve themselves from the moisture of the atmosphere and the voracity of birds. They advance successively upon the different branches of certain trees which they entirely strip of their leaves leaving upon their track the tapestries which defended them. It is under this protecting cloth that each of the caterpillars weaves itself a small cocoon about the size of a barleycorn. In some cases these cocoons are separated isolated and vertically suspended from the cloth which forms the roof of their tent and in others all these caterpillars assemble when they are ready to undergo their metamorphosis, so that in this case their chrysalises and their envelopes form a circular mass of follicles pressed together.

The species which are most known by their ravages and by the large extent of their woven fabrics, which always depends on the magnitude of the number of individuals which have made them, are those which naturalists have designated under the names of the plants which they seem to prefer, and which with the termination which Linnæus appropriated to all moths, have become their specific names, such as *Evonymella*, *Padella*, *Cognatella*, *Echiella*, *Sedella*, &c., according as they feed on the leaves of the spindle tree, the bird-cherry, the service-tree, the quince, the whitethorn, the orpine.

M. Duponchel has described and drawn nine species of this genus in vol. vii of the 'Nocturnal Lepidoptera of France' in plates 285 and 286.

MM. Audouin, Edwards, and Dumeril, are clearly of opinion that the tissues sent by MM. Levasseur and de Saumeray are the work of

the caterpillars of the *Yponomeutidæ*, but with regard to that sent by M Delahaye, they agree with him in thinking that it is the product of a number of small spiders of the genus *Epiere* of Walckenaer, for this tissue is somewhat glutinous and very much finer than that of the caterpillars, the threads of the latter not being adhesive like those of the spiders — *Compte Rendu*, Oct 28, p 533

STRUCTURE OF THE OVULE IN THE ERICEÆ

In many works on botany for instance in Lindley's 'Nat Syst of Bot' we find in the description of the *Ericæ* the words 'radicula hilo opposita' This has evidently arisen from a confusion of *hilum* and *chalaza* by a restricted consideration of the mature seed, for all *Ericæ* which I have hitherto examined present an anatropous ovule with simple (?) integument, whence it follows of itself that a *radicula hilo proxima* must exist in the ripe seed as also Kunth has correctly stated to be the case in his 'Flor Berol 1838 — Dr SCHLIFIDEN in *Wiegmann's Archiv*, Part IV 1839

COLOUR OF SALT MARSHES

A communication read November 4th at the French Academy of Sciences from M Joli Professor of Natural History in the College of Montpellier states that having carefully investigated the coloration of the salt marshes of the department of the Herault, he came to the following results —

- 1 The *Artemia salina* contributes only in a subordinate manner, and it may almost be said not at all, to this colouring
- 2 It is owing to infusorial animalcules
- 3 The *Hæmatococcus salinus* are only dead infusoria become globular
- 4 The *Protococcus salinus* are the globules which escape from their bodies after death

Upon the subject of the letter M Audouin remarked, that being in company with M Dunal in June 1838, he observed in the environs of Montpellier in several of the ditches of the salt marshes whose waters appeared to be free from colour, *Artemia salina* of a red colour only The intestinal canal of these little crustacea exhibited this colour and it was owing to the matter which it contained M Audouin had previously witnessed a similar phænomenon in the *Artemiæ* which M Payen brought under the notice of the Academy in 1836 Having put a score of them into fresh water in which he had dissolved sea-salt, he had an opportunity for a month

of observing the matter contained in their intestinal canal, renewed without interruption and always turning red without his ever having perceived in the water in which the crustacea lived any trace of coloured substance. Can the red colour which the ingested matter assumes in the intestinal canal of the little crustacea have instantly become developed by the act of digestion? This would be a new and very curious fact to verify. M. Audouin expressed a wish that M. Joli, who is favourably situated for varying his experiments, would apply himself to the solution of this interesting problem — *Compte Rendu*, Nov. 4 p. 570

FALCO ELFONORÆ

M. GÉNE has read before the Academy of Sciences at Turin the description of a new species of Falcon, discovered in Sardinia by M. de la Marmora which has been confounded with the Common Hobby (*F. Subbuteo*,) but from which it differs in its much stronger form in the colour of the cere, which is bluish, by the form of the cutting edges of the mandible, which are not notched between the base and the tooth, and by the colour of the eggs which are reddish, spotted and blotched with brown — *L'Institut*, 7th November

DESCRIPTION OF A NEW SPECIES OF *MELIPHAGA* BY M. DUBUS

Meliphaga cincta, capite toto collo, pectoreque nigris fasciculo postoculari niveo, fascia pectorali et humeris flavis, parapteris, tetricibus medius alarum prioribus et dorso nigris, plumis singulis flavo marginatis, posterioribus alarum tetricibus medius albis, speculum formantibus, remigibus et rectricibus fusco nigris, pogonus externis flavo marginatis, abdomine pallide brunnescenti-cano

Hab New Zealand

This species is remarkable from the length of the hairs which clothe the base of the bill and occiput at the origin of the nasal apertures. These hairs are somewhat stiff and extend over three-fourths of the length of the bill, which is slim, slightly curved and flat at its base. The wings are rounded, the first primary is very short, the second much shorter than the third, which is nearly equal to the fourth, the fifth is the longest of all. The tail is square, with feathers terminating in a point. The bill is black and the feet are brown. Entire length 7 inch, length of the bill from the suture to the apex 10 lin, of the tarsus 1 inch, of the middle digit 8 lin — *Bulletin de l'Acad. Roy. de Bruxelles*, Avril 6, 1839

FLANNEL FORMED OF INFUSORIA AND CONFERVÆ

On the 17th of October last, Professor Ehrenberg, laid before the Academy of Sciences of Berlin, a foot and a half square of natural wadding or flannel, consisting of *Infusoria* and *Confervæ* which was found to the extent of several hundred square feet near Sabor in Silesia, after an inundation. We have already had occasion in preceding numbers of this Journal, to lay before our readers Professor Ehrenberg's notice respecting the animal and vegetable nature of the meteoric paper of 1686 (See Annals, vol. iii pp 185 and 320,) and also the communication of Ehrenberg and Kersten respecting the natural leather of Freiberg, to which the present substance is analogous, but far more surprising from its occurrence in such an immense mass. The flannel is chiefly formed of unramified branches of *Conferva rivularis* interwoven with fifteen species of Infusoria and some shells of the water-flea (*Daphnia*). Of the Infusoria eleven belong to the family of the *Bacillariæ*, and of these six to siliceous-loricated genera, several *Closterina*, &c. Predominating are the *Fragillaria*, *Navicula viridis* and *Cryptomonas lenticularis*? All the forms are known species — *Beichte der Akademie* Oct 17, 1839

METEOROLOGICAL OBSERVATIONS FOR NOV, 1839

Chiswick — Nov 1 Hazy rain 2 Rain 3 Foggy rain 4 Rain fine 6 Hazy rain 7 Rain 8 Hazy rain 9 Fine drizzly 10 Hazy rain 11 Clear 12, 13 Hazy overcast 14 Fine rain 15 Hazy 16 Overcast clear and fine at night 17 Rain 18 Heavy rain 19 Fine a large halo round the moon at night 20 Fine rain 21 Stormy and wet 22 Overcast fine 23 Clear 24 Rain 25 Cloudy rain almost a hurricane at night 26 Clear 27 Dense fog 28 Hazy 29 Heavy rain 30 Overcast heavy showers

Boston — Nov 1 Stormy 2 Cloudy rain P.M. 3 Cloudy 4, 5 Rain rain early A.M. 6, 7 Cloudy 8 Cloudy rain P.M. 9 Cloudy 10 Cloudy rain A.M. and P.M. 11 Cloudy 12, 13 Foggy 14 Cloudy rain P.M. 15 Cloudy rain A.M. 16 Fine 17 Fine rain P.M. 18 Cloudy rain early A.M. 19, 20 Fine 21 Cloudy rain early A.M. rain P.M. 22 Cloudy 23 Fine 24 Rain 25 Cloudy 26 Cloudy rain early A.M. 27 Fine rain and snow P.M. 28 Cloudy 29 Rain rain early A.M. 30 Stormy

Applegarth Manse Dumfries-shire — Nov 1 Storm of wind with slight showers 2 Fair weather moderated 3 Fair fine 4 Rather moist 5 Clear and cold 6 Quiet day and cloudy 7 The same slight drizzle P.M. 8 Cloudy and moist 9 The same rain A.M. 10 Quiet day moist atmosphere 11 Calm day still moist 12 Showery all day 13 Mild day throughout no rain 14 Drizzly and gloomy a true Nov day 15 Rain all day heavy P.M. 16 Showery throughout 17 Fine day and fair 18, 19 Drizzling day 20 Very fine day rain P.M. 21 The same rain A.M. 22 Fine one shower P.M. 23 Frosty morning shower at noon 24 Rain all day 25 Showery A.M. cleared up P.M. 26 Cold and frosty morning shower snow 27 The same frost increasing more snow 28 Freezing all day snow lying 29 Storm of wind and rain snow gone 30 Rain nearly all day

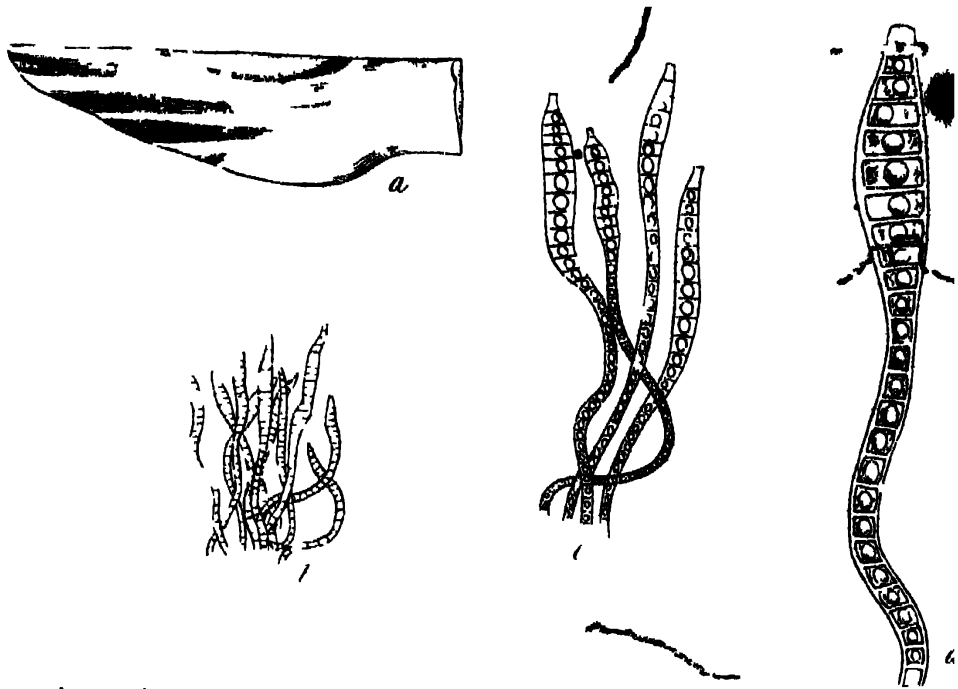
Sun 20 days Rain 16 days Snow 2 days Frost 3 days

Wind east 7 days South east and south-south east 5 days North 1 day North-east and north north east 4 days South-east 4 days South west and south south west 7 days West 1 day West-south west 1 day

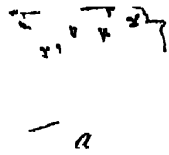
Calm 12 days Moderate 10 days Brisk 4 days Boisterous 2 days Strong breeze 1 day Stormy 1 day

Meteorological Observations made at the Apartments of the Royal Society by the Assistant Secretary, Mr ROBERTSON, by Mr THOMPSON at the Garden of the Horticultural Society at Chiswick, near London, by Mr VELL at Bost'n, and by Mr DUNBAR at Applegarth Manse, Dumfries-shire

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Hy 1 pendulum ad cendens Perle





J. Hinton ad nuz del.



British Annelides

J. Bast

ANNALS OF NATURAL HISTORY.

XLI — *On the Structure of the Setæ of Funaria hygrometrica*

By EDWIN LANKESTER, M D

THE hygrometrical properties of the *Funaria hygrometrica* have been long known to botanists, but as the movements produced in it by its sensibility to moisture are very singular, and as I am not aware of the subject having been dwelt upon by any botanist, I have been induced to prepare the following notice. This moss is one of the most common of the tribe, being found abundantly on dry banks and on the soil that barely covers the roots of full-grown trees, but it especially delights where the ashes of burnt wood cover the soil, and thus it may be frequently seen restoring the colour of the ground on those little black spots which indicate where the gipsy has pitched his tent, or in the woods or by the side of the hedges where wood has been burnt. The young thecæ make their appearance early in the spring, and in the months of April or May may be found accompanied by a number of dried setæ as well as others in all stages of their growth. If one of the dried setæ be taken in the hand, and its lower portion moistened with the finger, the capsule will be seen to turn from right to left, making two, three, or even more complete revolutions, if now the upper portion be moistened in like manner, the capsule will turn round more rapidly in a contrary direction. This phænomenon is exhibited whichever portion of the seta is first wetted. If both ends are moistened at the same time, a tremulous wavering is observed without any motion, but in a few seconds the capsule begins to move in one direction or the other. The direction in this instance is in some measure determined by the quantity of moisture applied, but the upper part seems most easily affected, and the motion arising from moistening it is much more rapid than from the lower portion. If the cap-

sule is held in the fingers the lower end presents the same motions. If both ends are held and the middle left free and moisture is applied, there is an evident effort made to curl the whole stem, but this is not effected.

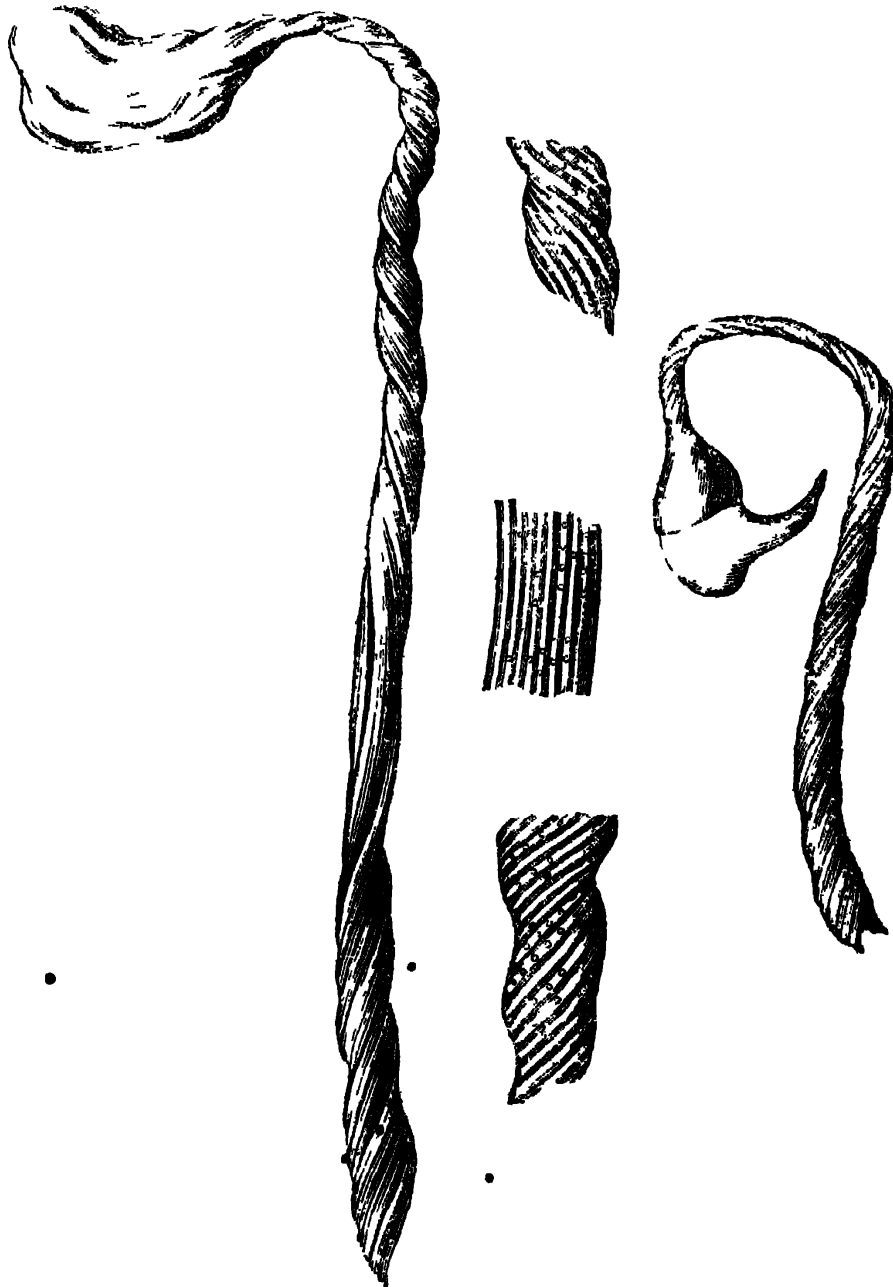
On observing these curious phænomena, I was induced to submit the setæ to an examination by the microscope, and their structure explains, in some measure, the nature of the motions observed. The entire seta is composed of an elongated cellular tissue which is arranged in a spiral manner (Figs 1, 2). The tissue is not however continued in the same direction through the whole length of the seta, but at about two-thirds of its length it begins to straighten, and at length in the upper part runs spirally in an opposite direction to that of the lower portion, the fibres forming a much more acute angle in the upper than the lower part of their course. This structure is most apparent in the dried seta. In the young state the fibres are quite straight, as they increase in age they become more spiral, and in the green setæ, just before the capsule is ripened, the spiral fibres with their double direction are quite evident (Fig 3). The immediate cause of the motions appears to be the absorption of moisture by the elongated spiral tissue. Whether the moisture admitted into the tissue straightens it by the force with which the fluid passes along the bent tubes, or whether it arises from the mere distension of the external tissue, may be a question. The capsule turns round in a direction contrary to that of the spiral of each end, and after the seta has been moistened and has turned round in both directions, its length is greater than it was previously. The more rapid movements of the capsule when the upper end is wetted is accounted for by the circumstance of the upper end of the seta being more twisted than the lower end. It does not however appear that the mere spiral form of the fibres is the cause of the motion, as this structure exists in the green setæ, which are entirely insusceptible of motion from the application of moisture. Nor is merely the dryness of the fibres the cause, as the green setæ, though thoroughly dried, do not exhibit any movement. But at the period of ripening the capsule is found bent towards the surface of the earth, and although I have not observed it turn-

ing round, I think it is probable that during this period a further twisting of the whole seta takes place, this direction being given by the already spiral form of the fibres, and constituting the true cause of the motions observed. This is rendered more probable by the fact that the spiral form of the tissue exists even after it has been macerated in water.

Fig 1

Fig 2

Fig 3



The subject of the spiral direction so frequently observed in the tissue of plants is one of great interest, and I believe little

has hitherto been done towards explaining the causes of the phænomenon. When the above observations were made I was not aware of any instance of a change in the direction of the spiral, but since then, Professor Morren of Liege has pointed out to me the occurrence of a double direction in the spire formed by the twisting of the tendrils of *Bryonia dioica*, and I have subsequently observed in the tendrils of a species of *Passiflora* a twisting not only in two opposite directions, but in alternately different directions for five or six times to the end of the spire.

XLII — *On the Tentacular Classification of Zoophytes* By
JOHN HOGG, Esq, M A, F R S, F L S, &c

IN his able and beautiful work on the 'British Zoophytes,' Dr George Johnston has reviewed most of the classifications that have as yet been brought forward for those extremely interesting animals, which have been generally called Polypes (*Polypi*) by most French naturalists, as well as for their *structures* or *habitations*, that have received, of late, the common appellation of Polyparies (*Polyparia*) from the same writers.

In the first place I may remark that three methods of classification present themselves to the investigator of this portion of natural history, first, that which is derived from the Polyparies or dwellings of the animals, — the second is taken from the natural organization and forms of the animals alone, that is to say, from the Polypes themselves, and the third, that method which may be founded on a combination of certain characters deduced both from the animals and likewise from their dwellings.

Now, as an example of the first method, in my sketch of the 'Natural History of the vicinity of Stockton-on-Tees,' which was written in the spring of 1825, but not published until the year 1827, I introduced an arrangement of many of our native Polyparies, grounded chiefly on the views of our own illustrious zoophytologist, the accurate Ellis, and in order that it may be clearly understood, I trust I may be pardoned for here subjoining an outline or synopsis of it.

POLYPARIA

Section I SIMPLICIA

Family I *Corallinoidea*

Order I VESICIFERA

Genus Sertularia (of the old authors)

Order 2 TUBIFERA

Genus Tubularia

Order 3 CELLIFERA

Genera Cellularia and Flustra

Family II *Coralloidea*

Order 4 PORIFERA

Genera Cellepora and Millepora

Order 5 STELLIFERA

Genus Madrepora

Section II COMPOSITA

Order 6 CORTICIFERA

Genus Corallina

Family III *Cretoidea*

Order 7 OSCULIFERA

Genus Alcyonium

Order 8 GELATINIFERA

Genera Spongia and Spongilla

It will be obvious to every one acquainted with Ellis's work on Corallines, that the first three orders correspond with, and are nearly the same as, the primary divisions of that author, viz 1 Vesiculated Corallines, 2 Tubular Corallines, and 3. Celliferous Corallines. And indeed, the above, if considered solely in relation to the British Polyparies or the inanimate and unorganized habitations of the animals—or as they have been aptly termed *Polypidoms* by Dr G Johnston—may perhaps prove to the student as useful an arrangement as any other which has hitherto appeared

Next, in pursuance of the second method of classification, and which most zoologists will at this day coincide with me as being the only true foundation for the systematic arrangement of zoophytes, I here venture to classify them according to their tentacles (*Tentacula*), which organs, considering their structure, their great use, and functions, I have, for several years past, accounted as presenting the best and most natural

forms and characters for that purpose. Although Dr Arthur Farre, by separating this class of animals into two divisions—the *Ciliobranchiate* and the *Nudibranchiate** Polypi—first publicly called the attention of the scientific world in his valuable paper in the ‘Philosophical Transactions’ for the year 1837, to the importance of the tentacula, which he has named *branchia*, with respect to a more correct classification of them

Class ZOOPHYTA

Sub-Class I BINOSCULA

Tribe I *Tentaculis armatis*

Order 1 CILIOTENTACULA

Genera Flustra, Cellularia, Cellepora, Plumatella, &c

Sub-Class II UNOSCULA

Order 2 NODITENTACULA

Genera Hydra, Sertularia, &c

Order 3 PINNITENTACULA

Genera Gorgonia, Pennatula, Alcyonium, &c

Order 4 GLANDITENTACULA

Genus Coryne

Tribe II *Tentaculis nudatis*

Order 5 PLANITENTACULA

Genus Tubularia, &c

Order 6 TUBITENTACULA

Genera Actinia Madrepora, &c

A few observations for the sake of briefly explaining this classification will be sufficient. The first subclass comprehends those zoophytes that are endowed with a higher and more perfect organization, and possess both a separate mouth and a distinct anus, which is signified in the appellation of *Binoscula*. As far as we are at present acquainted with these animals, they all have their tentacles armed, or fringed, with vibratory cilia.

The second subclass includes the *Unosculous* Zoophytes, or those which possess only a single hole or orifice, serving as well for their mouth as their anus. They are by far the most numerous. The order 2, *Noditentacula*, represents such ani-

* These terms are both somewhat objectionable, as being likely to be confounded with *Ciliobranchia* and *Nudibranchia*, names previously in use among the French writers.

mals as have their tentacula studded with minute projections, knots, or nodules, which are also said to be sometimes furnished with little bristles or setæ, for example, the *Hydræ* and the *Sertulariadae*. The order 3 embraces the genera *Gorgonia*, *Pennatula*, and others, whose animals retain well-defined pinnæ along their tentacles. But in order 4, we have, I believe, as yet discovered only one genus, *Coryne* here the tentacula are furnished at their tips with small glands.

The second tribe possess tentacles unarmed, and quite devoid of any projections or appendages whatsoever, in which, the order 5, *Planitentacula*, comprising the *Tubulariæ*, exhibit perfectly smooth and plain tentacula, and the order 6, *Tubitentacula**, as the *Actiniadae*, have their tentacles hollow, perforated at both extremities, and much resembling tubes or siphons.

I must however beg distinctly to state, that I propose this classification merely as an attempted, but by no means as a perfect one, because there may, not improbably, occur other variations and forms in the tentacula of even our British zoophytes with which I am now unacquainted, and which may necessarily lead to some modification in one or more of the previous orders, but for those of the foreign genera, some additional orders will doubtless have to be hereafter instituted.

From this systematic arrangement the *Corallines* and *Sponges* are excluded, because in the absence of all marks of any animal organization, and of every distinct animal property as yet discoverable in them, I must agree with Doctors Link, Muller, and Johnston, and several other distinguished authors, in restoring them to the Vegetable kingdom.

* Some one may perhaps be inclined to find fault not only with the nomenclature here used, *Zoophyta Ciliotentacula*, *Tubitentacula*, &c, but also with founding a classification principally upon the variations and differences which are discernible in one set of organs, him I would remind of the Linnæan arrangement of Insects, where he will notice *Insecta Lepidoptera*, *Neuroptera*, and several more variations in the *ptera* or wings alone. And I need scarcely add, that this arrangement of the immortal Swede will, in all probability, long survive many of the modern systems, which are grounded on the more numerous characters afforded by several organs.

XLIII — *Miscellanea Zoologica* By GEORGE JOHNSTON,
M D, Fellow of the Royal College of Surgeons of Edinburgh With Plates X and XI

• [Continued from p 232]

BRITISH ANNELIDES

IN the month of June of the present year, Mr Edward Forbes, accompanied by Mr Goodsir, visited the islands of Orkney and Shetland, with a view to the investigation of the marine zoology of the northernmost district of Britain* The Annelides which were collected during this tour, Mr Forbes, with a liberality I am most anxious to acknowledge, entrusted to my examination, and I am now about to give the result of it to the public, in the hope that this may interest such naturalists as devote themselves to the study of our native Fauna

Of the *Aphroditaceæ*, there were, in this collection, specimens of *Aphrodita aculeata* in a young state, of an *Aphrodita* nearly allied to the *A hystrix* of Savigny, and of my *Sigalion Boa* The new *Aphrodita* belongs to the section of the genus that is distinguished by having the scales or elytra naked or uncovered, and is the first British example of the kind The specimen presented to me is 14 lines in length, and 4 in its greatest breadth the body is elliptical, rather narrower posteriorly than in front, of a uniform greyish white colour, somewhat hairy and hispid on the sides from the various bristles which garnish the feet (Plate X fig 1, 2) The scales form a series on each side, they are roundish, smooth, thin and flexible, vesicular in the specimen, probably from immersion in the spirits, there are 15 pairs of them, but the 2 first pairs and the 3 caudal ones are so small as to be easily overlooked The head (fig 3) is entirely concealed under the front scales It is furnished with two proportionably large setaceous smooth palpi, approximated at the base, but I was not able to detect any antennæ The mouth (fig 4) is inferior, large, circular, puckered, armed with a strong retractile proboscis, the orifice of which is encircled with a row of ten-

* See the Athenæum, No 618, p 647

tacular papillæ (fig 5), but there is no appearance of jaws. There seemed to be 30 feet on each side, but, from the closeness and minuteness of the posterior pairs, the number was not very exactly to be counted. They are biramous, the branches widely apart. The *dorsal branch* (fig 6) of every alternate foot carries a scale or elytron, and is armed with spines, various bristles, and a sort of tangled hair, which partially covers the scale. It is shorter than the ventral branch, obtuse, somewhat sinuated, and contains two spines. The dorsal fascicle of bristles is long, reflected backwards, the bristles unequal in length, rather slender, sharp-pointed, smooth, and curved. The next fascicle consists of similar bristles but shorter, and there is a still lower fascicle of very slender ones. The *ventral branch* (fig 7) of the foot is strong, rugose, obtusely conoid, covered with minute transparent vesicles, and armed with five stout bristles, and with a spine of a yellowish colour. The bristles are not extruded from the extremity, but from a sort of projection beneath it. The two upper ones are filiform, obtuse, and of a dark brown colour, the two next are most protruded, smooth, paler, with a sharp slightly curved point, and the under one is short and acutely pointed like a dagger. This branch then is armed with no less than four different sorts of bristles, calculated both to cut and lacerate and to pierce any opposing body, but besides all these there is a soft filament (*inferior cirrus*, fig 7, a) that originates from a bulb near the base, and is long enough to reach considerably beyond the extremity of the foot. This is evidently a feeler, with which the worm acquaints itself with the nature of the opposing body,—whether an enemy that it needs to repulse by the extrusion of its formidable weapons, or a feebler animal that it can overcome and make its prey. To assist its tactic powers there are besides many *tentacular filaments* on each side, which originate from the dorsal branch of every alternate foot. These are smooth and subulate, and, except in their lesser size, resemble the palpi. The *spines* (fig 8) are of a light yellow colour, tapering from a broad base to an obtuse point, smooth and transparent. The *bristles* (fig 9—12) are brown with a bronzed lustre, various in size and strength, but all of them quite smooth. The surface of the *belly* has a

pearly hue, and the skin is thickly covered with minute vesicular granules (fig 13), similar to those which are seen on certain parts of the foot. The use of these is probably to give the worm a firmer hold on the ground, and prevent any retrograde movement from the various evolutions of the feet. In examining this complicated structure it is scarcely possible to refrain from some expression of surprise. "In figuris animalium (etiam minutarum) quam solers subtilisque descriptio partium, quamque admirabilis fabrica membrorum! Omnia, enim, quæ quidem intus inclusa sunt, ita nata atque ita locata sunt, ut nihil eorum supervacaneum sit, nihil ad vitam detinendam non necessarium*."

From the remarks of Audouin and Milne-Edwards, it appears that *Aphrodita hystrix* is subject to considerable variety in size, shape, and in the length of its feet†, and of course it would be frivolous to found any distinction of species on these particulars. But an inspection of their figure shows *Aph hystrix* to be a more hispid worm than the one now described, and there are other characters which seem to me sufficient to prove them distinct. I propose therefore to call the British species *Aph borealis*, and the specific characters of the two species may be thus given —

APH HYSTRIX, scales naked, proboscis with minute jaws, some bristles of the dorsal foot serrulate at their points, those of the ventral foot somewhat forked, inferior cirrus very short — Aud and Milne-Edwards, Litt de la France, ii p 70 pl 1 fig 1—9

APH BOREALIS, scales naked, proboscis edentulous, all the bristles of the feet smooth, those of the ventral foot simple, inferior cirrus rather long

PLATE X Fig 1 *Aph borealis* of the natural size 2 The same on the ventral aspect 3 The anterior part magnified 4 The same seen from below 5 The proboscis laid open 6 An outline of a foot 7 The ventral branch of a foot more highly magnified 8 Two spines 9 Bristles of the superior fascicle 10 A filiform bristle 11 A bristle from the ventral branch 12 Bristles from the inferior fascicle of the dorsal branch 13 A portion of the skin of the belly magnified

The *Nereides* in this collection were, 1 *Nereis margarita-*

* Cicero de Nat Deor lib 2

† Hist Nat du Litt de la France, ii p 74

cea, one of them measuring 7 inches in length, which exceeds considerably any specimen I had previously seen, 2 *Nephtys margaritacea*, 3 *Glycera alba* or *Nereis alba* of Muller, 4 Fragments of a *Psamathe*, probably the same as *P. fusca*, but greatly larger than my Berwickshire specimens, 5 *Phyllodoce lamelligera*, and Mr Forbes mentioned to me that he had also met with 6 *Phyllodoce viridis*

In other families there were specimens of *Cirrhatus medusa* and of *Amphitrite alveolata*, and several of a marine *Lumbricus*, but so much injured and broken that I did not attempt to ascertain the species. Of the family *Lumbricidae* there was another member, which first of all attracted my attention by the remarkable development of the anterior bristles that form, by their convergence, a large brush apparently terminating the head. This worm probably belongs to the genus *Trophonia* of Audouin and Milne-Edwards, but I know this genus only by the incidental and slight notice taken of it in their work on the Annelides errantes, and have seen no characters either of it or of its species.

TROPHONIA² GOODSIRII

Plate XI fig 1—10

DESC *Worm* from 3 to 4 inches long, as thick as a swan's quill, distinctly annulated, tapering insensibly backwards to an obtuse point, subcylindrical, but so flaccid after maceration in spirits that the sides almost fall together, of a uniform earthy brown colour or blueish underneath, rough with numerous granulations which are somewhat larger on the dorsal than on the plane ventral surface. The cuticle or outer skin is easily separable from the body, which then appears of a dull leaden blue colour, more or less iridescent. Front armed with a brush of long hair-like bristles. *Segments* between 50 and 60, homologous, narrower than broad, granulous, somewhat puckered and thickened on the sides, on which there are two distant bundles of non-retractile bristles, but no papillous feet. *First segment* very small, and as it were drawn within the second. *Mouth* subterminal, circular, edentulous, and unfurnished with organs of any kind. The *second* segment is rather less than the third, and from its anterior edge there

originate, on each side, two brushes of long bristles that project forwards, similar but shorter brushes are borne by the *third* segment, and still shorter by the *fourth*, but still they are long enough to mix with those of the second to form that hairy brush which arms the front, and so remarkably characterizes the worm. The bristles of the other segments are not longer than the breadth of the body, and are either laid over the back or projected from the sides. These *long bristles* (fig 6, 7) all belong to the dorsal brush, which consists of seven or eight, unequal in length, setaceous, smooth, slender and flexible, and closely annulated like the antenna of a lobster or Gammarus, with them are intermixed a few much shorter acicular bristles that are not annulated (fig 8) the *bristles* of the *ventral* brush are short and also of two kinds,—one kind setaceous and slender (fig 10),—the other stout, straight until near the extremity, where it is bent into a sharp cutting point there are four or five of them in each brush (fig 9) With a good magnifier we also discover that every one of the *granules* of the skin is tipped with a very short rather blunt spine. *Anus* terminal and simple.

From its softness and flaccidity, as well as from its structure, we may safely conclude that this worm burrows in the soil after the manner of the *Arenicola*, which it in fact resembles considerably. The brush of hairs on the anterior extremity will be in general protruded from the furrow, and is probably subservient to the capture of the prey. The hairs are, in all our specimens, soiled and infested with sordes and conferva-like filaments (fig 6), which, though they could not be removed with a brush, are undoubtedly extraneous, for the hairs are not equally and alike so disfigured, for while some were almost clean, others were greatly loaded with this foulness, and none of it was found on the bristles of the lower segments.

PLATE XI Fig 1 *Trophonia Goodii*, natural size 2 The anterior segments from above, and 3 The same from below, magnified 4 Three segments laid open by an incision through the ventral surface and spread out 5 A portion of the skin highly magnified 6 One of the front bristles. 7 A bristle from the dorsal brush of a segment from near the middle of the body 8 Another bristle from the same 9 A bristle of the ventral brush, and 10 One of the small ones that are associated with them

I have dedicated the species to Mr Forbes's companion, who is already well known to comparative anatomists by his ingenious researches into the development and structure of the teeth, and who promises to recommend himself to the gratitude of naturalists by an investigation of our native radiated animals

The worm I am next to notice possesses a considerable degree of interest, for some of the peculiar characters of three families meet apparently in it, and it connects them more closely than any genus hitherto discovered. The head reminds us of the *Echiurus*,—a genus in the family *Lumbricidæ*, the position of the mouth is much the same as in *Cirrhatulus*, and there is some analogy between them in the structure of the feet, while the anus resembles that of *Nerinne*, which, as well as *Cirrhatulus*, belongs to the *Ariciadæ*, but then the form of the body and its annular structure is that of *Arenicola*, and notwithstanding some obvious discrepancies, this worm ought perhaps to be referred to the family of which *Arenicola* is the type, though there is no genus in it with which the species before us can be associated. I therefore propose to create a new genus in the family for its reception, to which the name *Travisia* may be given, in commemoration of Mr Travis, an eminent surgeon in Scarborough, and one of those "learned and ingenious friends" to whose correspondence Mr Pennant was much indebted in preparing his *British Zoology*

Family ARENICOLIDÆ

- 1 *Arenicola* Mouth terminal, branchiæ arbuscular
- 2 *Travisia* Mouth ventral, branchiæ a simple filament.

• TRAVISIA FORBESII

Plate XI Fig 11—18

In figure this annelide is something between that of the earth-worm and the leech: it is elliptical anteriorly, narrower and subcylindrical in the posterior half, of a uniform dull olive-green colour, smooth to the naked eye, distinctly annular. Both sides are so alike that it is not easy to say at first which is the dorsal and which the ventral, but the anterior segments are so far unlike the posterior ones, that, to render

the description more distinct, it may be advisable to consider it as divided into an anterior and a caudal half

The anterior half consists of about 14 segments, increasing gradually in diameter till near the middle, when they begin again to decrease a little. The first or cephalic segment is very small, pellucid, triangular, sharp-pointed like a snout, and somewhat concave underneath. It is destitute of every kind of appendage. The second segment is rather broad, and like the succeeding, excepting that it is single and without any armature. The other segments consist each of two, or sometimes three narrow rings, and each of them is furnished, on each side, with a dorsal brush of bristles, a long filament, a circular pore, and a ventral brush of bristles, similar to the dorsal, but smaller. On the secondary or intermediate rings there are no bristles, but one, two, or even three pores. The mouth is perforated between the third and fourth segments on the ventral surface, it is circular, with thickened puckered lips, edentulous, and without a proboscis.

The anterior segments pass by a sort of gradation into the caudal ones, though it is not difficult to mark the distinction. They are less in diameter, but broader in the opposite direction, and thickened on the sides, where there are two short obtuse fleshy papillæ. From the base, and below the dorsal papilla, the soft filament or cirrus originates, which does not exceed half the length of the anterior filaments. Close to the cirrus there is a brush of bristles, but I could not discover a second brush. There are thirteen of these caudal segments with a very narrow one between each. The last but one is small and unarmed, and the anal one is terminated with six soft obtuse papillæ forming a sort of cupped circle round the vent.

The skin of the worm, under a magnifier, appears to be granulated on the dorsal, and punctured on the ventral surface. The bristles are slender, unequal, slightly curved, acicular, smooth, and unjointed. They vary in number in the segments, but scarcely exceed twenty in any single fascicle, and are never fewer than four or five. Those of the dorsal brush are longer than those of the ventral, but do not otherwise differ, and both brushes come from the skin, and not from a papil-

lous foot There are no spines The cirrus or branchial filament is soft and filiform

It is necessary to observe that this description is drawn up from the examination of a single specimen, which had grown soft by maceration in the spirits, and was somewhat injured by the carriage Thus the filaments or cirri of several segments were broken away, and I ought to mention that there were no traces of any on the third, fourth, and fifth segments The specimen was rather more than an inch in length, but, from its structure, the worm is obviously capable of being elongated to a considerable extent

PLATE XI Fig 11 *Travisa Forbesii*, of the natural size 12 The same, magnified 13 The cephalic segments 14 A side view of a segment from near the middle 15 A view of a caudal segment on the dorsal aspect 16 The same on the ventral aspect 17 The anal segments 18 A few bristles

XLIV — *Note on the Occurrence at various times of the Bottle-nosed Whale (Hyperoodon Butzkopf, Lacep) on the coast of Ireland, and on its nearly simultaneous appearance on different parts of the British coast in the autumn of 1839* By WILLIAM THOMPSON, Esq, Vice-President of the Natural History Society of Belfast

IN Bell's 'British Quadrupeds,' &c published in 1837, the latest work treating of our Cetacea, it is observed, with reference to the two individuals of this species recorded by Dale and Hunter, that "these are the documents upon which alone we have to depend as to the occurrence of the *Hyperoodon* on the British shores" The works of Jenyns* and Jardine† do not contain any reference to other British specimens More recently Mr Thompson of Hull has, in the Magazine of Natural History for 1838 (p 221), described a whale of this species which was stranded near that town in 1837, and whose skeleton is preserved in the Hull Literary and Philosophical Society.

The first particular record known to me of the occurrence

* Manual of British Vertebrate Animals, 1835

† Naturalist's Library, vol on Whales, 1837

of the *Hyperoodon* in Ireland, is contained in the Dublin Philosophical Journal for March 1825, where Dr Jacob (now Professor of Anatomy and Physiology in the Royal College of Surgeons in Ireland) very fully and ably describes a specimen dissected by him, and at the same time, after a due examination of its anatomy, treats of the place the genus should occupy among the Cetacea*. The individual which formed the subject of the essay "was stranded at Killiney, a few miles from Dublin, in the month of September [1824?]" Its perfect skeleton is preserved in the museum of the College of Surgeons in Dublin. In Mr Templeton's Catalogue of Irish Vertebrate Animals†, the *Hyperoodon* is mentioned as "occasionally" met with.

From Dr Jacob I learned in November last, that within twenty five years he has known four bottle-nosed whales to be stranded within a short distance of Dublin—of these, all, except the one particularly described by him, were taken at Howth, near the entrance of the bay on one occasion, two of them occurred at the same time.

Early in the month of August 1836, two *Hyperoodons* were stranded at Dunany Point, near Dundalk. A friend who saw the specimens when quite recent, described them to me as bottle-nosed whales, and on my sending to him for the purpose of identification outlines of the individuals figured by Dale and Hunter, he stated that the form of Dale's figure represented them well. The larger of these animals was 17 feet in length and $14\frac{1}{2}$ in girth, the other was somewhat smaller. Having been stranded on the property of his relative, Lady Bellingham, their heads were fortunately reserved for my friend Dr Bellingham of Dublin, I had lately an opportunity of examining both of these specimens, one of which is in the Museum of the School of Anatomy, Peter-street, the other in that of the Royal Dublin Society. In the latter collection is the head of a second *Hyperoodon*, which in all probability was

* The name of *Hyperoodon* is objected to by Dr Jacob as expressing what the animal does not possess—teeth in the palate, this part having been as smooth as the rest of the mouth in the specimen he dissected. *Ceto diodon* was proposed by Dr Jacob as a generic name, and *Hunteri* was applied by him to the species. This elaborate memoir though published in 1825 is unnoticed in any of the above-cited works.

† Mag Nat Hist vol. 1 New Series

obtained on the Irish coast, but I could not ascertain the locality whence it had been received it is similar in size to the smaller of the Dundalk specimens, and a very few inches less than the larger, the measurements of which are as follow

	ft	in
Length from occiput to end of snout	4	6
Breadth of cranium	2	4
Height of ditto	2	0

The crania of the four *Hyperoodons* preserved in Dublin are, I conceive, referrible to one species, and are similar to those represented in Cuvier's 'Ossemens Fossiles,' pl 225 ed 1834 F Cuvier's 'Histoire Nat des Cétacés,' pl. 9, and Bell's 'Brit Quad' &c p 496 From what has been already published on the subject any further remarks on these specimens seem to be unnecessary As supplementary to what appears in Mr Bell's work, it may be added with reference to a specific character about which there has been some obscurity, that in the individuals particularly described by Dr Jacob and Mr Thompson of Hull, two teeth were present in the lower jaw, but in neither instance were they apparent in the recent animal, but were detected only when the gum was cut into in the preparation of the skeleton

Having heard on the 20th September last, that a whale had been captured at Ballyholme Bay, near Bangor (county Down), on the 16th, I immediately set out for the place accompanied by a scientific friend, Mr Hyndman A small portion only of the animal then remained on the beach, the head, tail, and entire skin with the blubber having been removed This whale was seen on the evening of the 16th Sept in shallow water not far from the shore, and a boat with the small complement of three "hands" gave chase Fire-arms were discharged at it, but these apparently not having any effect, its assailants bound a rope to a pick-axe and drove this rude but successful substitute for a harpoon into the animal, and about the same time managed to throw a loop of rope round its body above the tail, and thus with some little difficulty brought it captive to the shore Its length was stated to have been 24 feet, the breadth of tail 6, the girth at the thickest part perhaps from 18 to 20 feet, the weight was estimated at about 5 tons

The entire upper surface was of a blackish-grey colour, the under parts somewhat paler. The stomach is said to have contained the remains of shells, and what was described to be like the "feet of fowls"—these I have little doubt were portions of the arms or feet of cuttle-fish* (*Sepiadæ*). Although it was late in the evening when this whale was brought ashore, its captors at once commenced taking off the blubber, so that unfortunately no person who would have felt a scientific interest in the spectacle, had the opportunity of seeing the animal in a perfect state. During the progress of cutting up on the day after its death, the body was still warm and smoking.

To the intelligent farmer whose property this whale became, I showed all the figures of *Cetaceæ* in Mr Bell's work, when he at once, from the narrow elongated snout, and head arising abruptly from it, identified the specimen with the *Hyperoodon*, objecting only to the snout not being represented so long comparatively as in the real animal. To another respectable farmer who had got its head, I exhibited these figures, and he also immediately singled out the *Hyperoodon*, considering the figure of Dale's specimen as more characteristic of the general form of the animal than that of Hunter's, the tail of this latter however being the better liked. The gape or opening of the mouth was remarked to be thus  or "like the letter f"—teeth none—the snout shaped like a bottle—it was similarly described by our first informant. In a newspaper paragraph

* Dr Jacob says of the *Hyperoodon* he dissected, that the oval cavity into which the œsophagus opened "contained a large quantity of the beaks of cuttle-fishes, perhaps two quarts." Again, in the Catalogue of the Museum of the Royal College of Surgeons in Ireland, p 161, there appears—"Cuttle-fish bills found in the stomach of a *Balæna rostrata*." Apprehending that this rather referred to the *Hyperoodon* than the *Balæna*, I wrote to Dr Jacob respecting it, and learned in reply that the "cuttle-bills" so mentioned were those taken from the former species by him—this is noticed merely to prevent error. In the specimen of *Balæna rostrata* dissected by Dr Jacob, the remains of herrings only were detected (Dublin Phil Journ November 1825, p 343). The Rev Dr Barclay remarks of the Round-headed Porpoise (*Delphinus melas*) that "its favourite food seems to be cuttle-fish, of which great quantities are generally found in the stomach"—Bell's Brit Quad 485. In this species my friend R. Ball, Esq. has likewise observed the remains of these cephalopods. In Mr Hyndman's possession are the beaks of cuttle-fish taken from the stomach of a whale (but of what species I have not learned) captured on the coast of Waterford some years ago. The consumption of these animals by at least two species of our *Cetaceæ* would thus seem to be considerable.

respecting this whale, it was stated that "the blubber produced 140 gallons of oil, which were computed to be worth above 20*l* sterling"

In connexion with the occurrence of this *Hyperoodon* on the coast of Down, a novel and highly interesting fact is to be recorded—that there evidently was a migration or simultaneous movement of these *Cetaceæ* towards the British shores during the last autumn, several individuals having within a very weeks been obtained in England and Scotland, as well as Ireland, but all upon a limited range of coast bounding the Irish sea and its vicinity. The first capture known to me is that of the individual already recorded. In the 'Northern Whig' published at Belfast on the 26th Sept it was stated, that—"A bottle-nosed whale, 20 feet long, was last week left on the beach at Flimby near Cockermouth." In the 'Belfast News-letter' of Oct 1, appeared the following notice—"A whale captured near Liverpool—On Tuesday last, a whale was left by the receding tide on East Hoyle bank and speedily captured by the fishermen. Its length is 24 feet, its girth round the centre of the body 13 feet*." Although this is not called the bottle-nosed species, it seems to me a fair presumption so to consider the specimen, as its dimensions accord with those of the other individuals taken about the same time, and of which one was obtained on the coast of the adjacent county of Cumberland. In the 'Belfast Commercial Chronicle' of Oct 21, was this paragraph, copied from the Stranraer Advertiser—

"*Capture of Whales in Lochryan*—On Tuesday morning last, 15th of October†, a very unusual appearance presented itself in Kirkcolm. Two monsters of the deep, of the bottle-

* In connexion with this paragraph it was observed—"On Friday two young whales were got in the Clyde, the one on the beach at Rosencath, the other above Dumbarton or West Ferry." Unfortunately no particulars are given that would lead to a knowledge of the species. About the same time it was mentioned in the newspapers, that a whale proceeding southwards had passed close to one of the packets plying between Holyhead and Dublin.

† About four weeks previous to this time, a friend informed me that upon two successive days a whale (which he saw) appeared off Ballantrae (Ayrshire), some miles north of Lochryan, on the second day it was about two miles to the south of where it was seen on the preceding, and was still advancing southwards.

nosed description of whale, had come round the Scaur and embayed themselves, the receding tide swept its treacherous waters from under them, and finding themselves grounded, their mighty exertions were truly terrific, yet unavailing for their extrication. Mr Robertson of Clondry was the first who took notice of the errant strangers, and arming himself and retainers with pitchforks and knives, repaired to the scene of action, and commenced the terrible onslaught. The dying agonies of the mighty monsters were truly tremendous. Desperate from the repeated thrusts of the opponents, and from their inextricable position, their powerful tails were wrought with astonishing effect. The water (of which there was yet a quantity around them) was lashed into foam and agitation, the crested waves stretching to an incredible distance, while high in air the water ascended in one unbroken sheet. From their blow-holes the crimsoned water was sent in a jet, imposingly grand, to a great height. After similar and protracted writhings, with a kind of snort or roar, their fury subsided, and in a short time all was still. They were towed to the shore amidst the gaze of numerous and wonder-stricken spectators, a large number of whom arrived hourly to inspect them. A number of men was then employed to cut off the blubber, of which there were thirteen barrels, loading five carts. The dimensions of the largest fish was 24 feet 4 inches in length, and 16 feet at the thickest part in circumference, the smaller one about 16 feet long, and thick in proportion. The tail of the largest was $6\frac{1}{2}$ feet in breadth."

It is very probable that other paragraphs to the same effect may have appeared in the newspapers, especially as those here introduced I observed merely on a casual perusal of some of those published in a provincial town. It is rarely that such notices are of any service to the naturalist, but the very peculiar form of the head of the animal under consideration (whence it has received the name of *Bottle-nosed Whale*) taken in connexion with the dimensions stated, leaves no doubt in any instance here quoted that the *Hyperoodon* is alluded to. Were the size of the individual described about *one half* of what is reported, then would there be a doubt whether the captives might not have been the *Bottle-nosed Dolphin*.

(*Delphinus Tursio*, Fabr), a much smaller species, having the snout prolonged somewhat like that of the *Hyperoodon*, and which is occasionally taken on the British coast

The three *Hyperoodons* recorded to have occurred on the English shores appeared singly The two particularly described by M Baussard* were taken in company at Honfleur, and considered a mother and her young—the one was 23, the other 12 feet in length Of the seven individuals captured on the Irish coast, they on two occasions appeared in pairs, and in one of the three instances here copied from newspapers, two of these whales were secured at the same time It would be interesting to know whether those which have so appeared were male and female—at all events it would seem that the species is not gregarious

So very little of the history of the *Hyperoodon* is known, that it is hoped even the few particulars here recorded may prove an acceptable contribution

XLV —*New Orchidaceæ* By Professor LINDLEY

HABENARIA (A § 1 xx b) *setifera*, foliis ensiformibus carinatis erectis apice incurvis setiferis, caule foliato 1—2-floro, bracteis inflatis ovario longipedunculato brevioribus, petalis bipartitis laciniâ anteriore linearî posterioris longitudine, labelli tripartiti lacinus linearibus carnosus intermediâ longiore, calcare pendulo clavato pedunculo subæquali —*Mexico*, Ad Choapam, inter gramina, Junio Hartweg

A plant allied to *H macroceras*, of which it has much the habit •

PLATANThERA (§ 1 a) *limosa*, caule folioso, foliis ensiformibus erectis, racemo laxo multifloro, bracteis striatis acutis floribus brevioribus, petalis ovatis sepalsque obtusis, labello linearî convexo obtuso labello filiformi pendulo pluries brevior —*Mexico*, In paludibus, Anganguco, juxta Asoleadero, Sept Hartweg

PLATANThERA (§ 1 a) *volcanica*, caule folioso, foliis ensi-

* F Cuv Hist de Cet pp 242, 249

formibus erectis trinerviis, spicâ elongatâ cylindraceâ, bracteis herbaceis acuminatissimis floribus longioribus, petalis ovatis sepalisque obtusis, labello lanceolato obtuso medio subcalloso calcare filiformi triplò brevior, antherâ subhorizontali, rostello plano 3-lobo — *Mexico* Real del Monte, in agro volcanico prope Guajolote, Oct Hartweg

The stem of this plant is from 1 to 3 feet high, or even more. Its nearest affinity is with *P leucostachya*. The sepals are herbaceous, the petals and lip purple.

EPIDENDRUM *falcatum*, caule ramoso carnosio membranulis laxis imbricatis vaginato, foliis solitariis falcatis canaliculatis acutis, fasciculis florum sessilibus pedunculis elongatis, sepalis petalisque lineari-lanceolatis patentissimis, labelli tripartiti basi bituberculati lacinus laterilibus oblongis dimidiatis integris intermediâ lineari-lanceolatâ paulò longiore — *Mexico*, Hacienda de S^a Ana prope Oaxacam, in rupibus et inter lapides, Maio Hartweg

A very fine species with large white flowers. Allied to *E nocturnum*, but with a totally different habit.

EPIDENDRUM (*Amphiglottis*) *cochlidium*, foliis distichis ovato-oblongis obtusis emarginatisque coriaceis, labelli lacinus laceris subæqualibus callo carnosio excavato trilobo æquali parùm majoribus — In *Peruvia* Mathews (in hb. Hooker, 1868) Flores verisimiliter flavi

EPIDENDRUM (*Amphiglottis*) *ellipticum* (Graham) β *flavum*. Adest varietas "floribus pulchrè flavis" insignis, caule tripedali, in herb Mart in *Brasiliæ* campis editis Itacoluni, prov Min Ger lecta, notâ nullâ a varietate roseâ quantum video distinguenda.

EPIDENDRUM (*Amphiglottis*) *Martianum*, foliis distichis angustis lanceolatis, caule apice ramoso squamis concavis obtusiusculis vaginato, racemis corymbosis, petalis linearibus obovatis obtusis sepalis multo angustioribus, labello cordato subrependo basi bituberculato axi elevatâ — In *Brasiliæ* campestribus ad Villam Ricam, prov Min Ger Martius. Caulis $1\frac{1}{2}$ —2-pedalis. Flores pallide vi-

rides, extûs margine et dorso punctis rubris Labellum
convexum *E fuscato* affine

EPIDENDRUM (*Amphiglottis*) *setiferum*, foliis distichis lanceolatis acutis, caule simplici squamis linearilanceolatis acuminatis sub floribus foliaceis vaginato, racemo cernuo, bracteis longissimis setaceis, petalis linearibus obovatis obtusis sepalis angustioribus, labello cordato integerrimo reticulato acuto basi trituberculato — In *Brasilia*, Gomes, prov Min Ger Martius

ORNITHOCEPHALUS *Myrticola*, racemo pendulo hispido, sepalis lateralibus petalisque rotundatis integerrimis reflexis ciliatis, labello cordato-lanceolato acuminato canaliculato callis baseos marginantibus distinctis integerrimis — Citri odorem spirat In myrtaceis *Brasiliæ*, prope Bom Jesus de Bananal, Maio, Descourtiz

A very curious plant with short pendulous racemes of small white flowers It has quite the habit of *Oncidium iridifolium*

ORNITHOCEPHALUS *grandiflorus*, racemo erecto stricto glabro, bracteis oblongis obtusis herbaceis, petalis labelloque cymbiformi saccato denticulatis basi cristâ bilobâ transversâ carnosâ erosâ aucto, dinandrio marginato denticulato — In *Brasiliæ* montibus Organ dictis, Gardner, 633

A very fine species with large yellow flowers The leaves are oblong, obtuse, obscurely veined, and apparently much thinner than is usual in this genus

ORNITHOCEPHALUS *apiculatus*, foliis racemo erecto denso multifloro multò brevioribus, petalis oblongis dentatis, labello ovato concavo basi sagittato integerrimo apiculo membranaceo acuto — In *Peruvia*, Pavon

A very small species, only 2 or 3 inches high, with flowers apparently deep yellow

ORNITHOCEPHALUS *ciliatus*, sepalis petalisque latioribus membranaceis rotundatis reflexis ciliato-fimbriatis, labello carnosio cordato canaliculato acuminato apice dilatato obtuso membranaceo, rachis hispida — In *Demerara*, Loddiges

This species is nearly related to *O Myrticola*, from which it

differs in its fringed petals, and in the dilated rounded membranous apex of its fleshy lip

ORNITHOCEPHALUS *inflexus*, sepalis acutissimis erectis carinatis, petalis rotundatis serrulatis, labello oblongo acuto concavo apice inflexo margine baseos utrinque calloso — *Mexico*, Hartweg

CATASETUM *laminatum*, labello saccato apiculato basi fimbriato axi lamellâ unicâ altâ basi bilobâ instructo, columnâ cirrhata — *Mexico*, Hartweg

A very fine species, remarkable for a deep plate running along the labellum, from base to apex

DICHÆA *squarrosa*, foliis linearibus squarroso-recurvis, floribus subterminalibus, labello cymbiformi sessili apiculato columnâ glabrâ anticè unidentatâ — *Mexico*, Hartweg

Flowers large for the genus, apparently white

ARPOPHYLLUM *spicatum* (Llave), folio carinato arcuato, pedunculo spathâ brevior — *Mexico*, Hartweg

Flowers deep purple, arranged in a spike about 3 inches long

ARPOPHYLLUM *giganteum* (Hartweg in litt), folio ensiformi plano, pedunculo spathâ multò longiore — *Mexico*, Hartweg

This fine plant must be at least 3 feet high, its flowers are pale lilac, and disposed in a spike from 6 to 7 inches long

CYRTOCHILUM *graminifolium*, foliis linear-ensiformibus acutissimis erectis racemo subpaniculato brevioribus, labello obovato integerrimo basi 5-lamellato, columnæ alis parvis rotundatis — *Mexico*, Hartweg

This species is much like *C. maculatum*, but differs in the form of its lip, its very narrow leaves, and smaller flowers

SPIRANTHES *ramentacea*, aphylla? vaginis caulis laxis membranaceis acuminatis, labelli limbo concavo ovato integerrimo obtuso, ungue et columnâ in medio pubescentibus — *Mexico*, Prope Santa Barbara, regione calidâ, April, Hartweg

This very curious species has altogether the appearance of *Altensteina* or of *Apaturia*

EPIPACTIS *americana*, foliis inferioribus ovalibus superioribus lanceolatis, bracteis floribus longioribus, racemo laxo sursùm pubescente, hypochilio medio muricato, epichilio ovato acumine lato membranaceo — *Mexico*, Juxta Rio del Salto cataractas, locis umbrosis, 'April, Hartweg, *Nova Albion*, Douglas, *Texas*, Drummond

An American *Epipactis* is a great novelty, this appears to be the only species found as yet on that continent It ranges from the Columbia river as far as Mexico

•XLVI — *Note on the Annelida* By W S MACLEAY, M A, F L S, &c *

THESE animals differ from true *Annulosa* in being hermaphrodite, and in general red-blooded† They are soft vermiform animals of an articulated structure, and which form the immediate connexion between such *Vertebrata* as *Amphioxus* and *Myxine*, and such *Annulosa* as *Porocephalus* and other white-blooded *Vermes*, which have the sexes distinct

I divide the *Annelida* as follows

ANNELIDA

NORMAL GROUP		
POLYPODA Marine animals, having their body provided with distinct feet	NEREIDINA	Animals free, having a distinct head provided with either eyes or antennæ or both
	SERPULINA	Animals sedentary, and having no head, provided with eyes or antennæ
ABERRANT GROUP		
APODA Body without feet or a distinct head	LUMBRICINA	Animals without eyes or antennæ Body externally setigerous for locomotion Articulation distinct
	NEMERTINA	Animals aquatic, without eyes or antennæ Body not externally setigerous Articulation indistinct
	HIRUDINA	Animals provided generally with eyes but not with antennæ Body not externally setigerous Articulation distinct

* From 'The Silurian System,' by R. I. Murchison, Esq, p 699

† Milne Edwards is said in the public journals to have discovered that

NEREIDINA, MacLeay

These are the most perfect in their structure of all *Annelida*, as they possess numerous organs and have a distinct head, which is generally provided with eyes and antennæ. Some of them, after the manner of *Serpulina*, inhabit tubes, which tubes are membranaceous, and formed by a transudation from their body, but in general the *Nereidina* are naked, and they are always agile animals freely moving about in search of their prey. Aristotle calls them, “Σκολόπενδραι θαλάσσιαι παραπλήσιαι τῷ εἶδει ταῖς χερσαίαις,” (Lib ii c 121), and it is true that they are wonderfully like Centipedes. The fossil impressions in the Llampeter Rocks, are too indistinct to enable us to determine very accurately the genera and species of *Nereidina* which there occur, more particularly as the generic characters in this group depend on such minute distinctions as are afforded by a study of the mouth, antennæ and eyes. I shall therefore consider the impressions fig 1 and fig 2 Murchison, *Sil Sys* to belong to the

Genus NEREITES. A genus which comes very near to Savigny's genus *Lycoris* in its external appearance, only the segments of the body are here perhaps more slender and in proportion longer than usual.

Spec 1 *Nereites Cambrensis* Murch n s

The body of this species seems to have consisted of about 120 segments. The feet were half the length of a segment of the body, and the cirri of the feet were longer than such segment — *ib* Pl 27 f 1

Spec 2 *Nereites Sedgwickii* Murch n s

Body much more slender than that of *N Cambrensis*, and apparently consisting of a greater number of segments. These segments have the feet attached to them apparently inconspicuous, although the cirri are very distinct. Pl 27 f 2

N B. The impression now under consideration was clearly

some *Annelida* are not provided with red blood, but the distinguished Savigny stated the same fact so long ago as the year 1823, for in his *Système des Annelides* he places *Clepsine* among his *Hirudinées*. Nay, even Cuvier, who first distinctly pointed out the group under the name of *vers à sang rouge*, has said that their blood is only generally red. Although hermaphrodites, many of them require a reciprocal coitus.

that of an animal, as will appear by the figure, where the worm has evidently, before coiling, with difficulty trailed itself along in the mud, in a way, which any one accustomed to collect these *Annelida* will at once recognise

Genus MYRIANITES

Body linear, very narrow, and formed of very numerous segments with indistinct feet and short cirri

Spec 1 *Myrianites MacLean* Murch *n s* —Pl 27 f 3

N B The softness of the texture of the foregoing three species of *Annelida* and the perfection of the impression in fig 1 make it very remarkable, that if articulated feet existed in the Trilobites, some vestiges of them, even although membranaceous, should not have come down to us more perfect than those figured by Goldfuss (See Ann Scienc Nat vol xv Pl 2 f 8 and pp 665, 667 *ante*)

SERPULINA, MacLeay

These are sedentary animals without eyes or antennæ They live in tubes which are either a natural transudation of their body, and are either membranaceous or calcareous, or their tubes are semifactitious, being then composed of an agglutination of particles of sand or other small substances The calcareous nature of the tube in some *Serpulina* is very advantageous for their preservation, and has thus enabled us to see that such animals occurred frequently in the Upper Silurian Rocks

Genus SERPULITES

Spec 1 *Serpulites longissimus* Murch *n s* Pl 5 f 1

Very long, hardly diminishing in diameter, compressed,
• smooth, slightly tortuous, composed of numerous thin layers of shell containing much animal matter

No part of this extraordinary fossil has been observed attached to other bodies, it forms large curves, sometimes almost circles, occasionally even a foot in diameter. The tube is so much compressed that its sides nearly touch, and that this is the effect of pressure is shown by the form it has assumed. Those parts which were nearly perpendicular to the direction of the compressing force have resisted pressure most powerfully, and fractures have taken place in longitudinal lines near

such parts The quantity of animal matter in the laminæ gives them an opalescent appearance In structure, this fossil resembles the *Serpula compressa* of Min Con, tab 598 f 3, but it does not diminish so rapidly Width $\frac{1}{2}$ an inch

NEMERTINA, MacLeay

The *Nemertina* are white-blooded worms like some of the *Hirudina* or *Leeches* In this group, however, the character of articulation becomes most indistinct Rudolphi has placed *Gordius* along with *Nemertes* (Ent Syst 572), and if *Gordius* goes into the group of *Nemertina*, it is possible that *Filaria* may also *Nemertes Borlasii*, is a long black sea-worm, which is said to suck Testaceous *Mollusca* The articulations of its body become visible when it is contracted If the long vermiform impression in the Cambrian Rocks of Llampeter, Murch Sil Syst Pl 27 f 4 belong to organic substances, it can only be referred to some animal between *Gordius* and *Nemertes*, although probably nearer the former genus As yet, however, *Gordius* are only known to occur in fresh water, whereas this fossil production, if it belong to the animal kingdom, was evidently, like *Nemertes*, a native of the sea

Genus NEMERTITES ?

Animal marine, with the linear body, of a *Gordius* or *Filaria*

Spec 1 *Nemertites Ollwantu* Murch n 9 Pl 27 f 4

XLVII —Notes on the Excitability and Movement of the Leaves in the Species of *Oxalis* By Professor J DE BRIGNOLI DE BRUNHOFF of Modena, and Prof MORREN of Liège

In the Bulletin of the Royal Academy of Brussels for last July, an extract is given by M Morren, of a letter received by him from Prof de Brignoli of Modena, of the 23rd of May 1839, containing some interesting details relative to the excitability and spontaneous movement of the leaves of *Oxalis stricta*, which had been accidentally observed by two of his pupils, one of whom had casually, whilst engaged in conversation, been striking them with a small cane among the plants that grew wild under the trees in the public garden

"After a little while," he observes, "they perceived that one of these plants had changed the position of its leaves, and they at once suspected that it was an irritable plant which I had never mentioned in my lectures. I was in the botanic garden, which is contiguous to the public garden, at the time, they came and told me of this fact, which was not less new to me than to them. I went with them to the spot, and found that the plant was the *Oxalis stricta*. This is not mentioned in the list of species designated by authors as *sensitive*. I immediately repeated the experiment upon other individuals and obtained the same effect, but *it must be teased a long while, as its movements are much slower than those of the Mimosa pigra*. I suspect that if plants were observed with the requisite care, the phenomenon of irritability would not be so rare as is supposed. The irritability of the *Oxalis sensitiva* is already known. I have made experiments upon all those cultivated in our botanic garden, but I did not succeed in causing the position of the leaves to change. I believe that heat is the principal agent in this phenomenon, because even the *Hedysarum gyrans* slackens in its movements in autumn and during winter in hothouses. I should think that all the species of *Oxalis* are susceptible of contraction when irritated, but as most of them are natives of the Cape of Good Hope, it is possible that they show no effects from concussion in our climate, whose greatest heat never equals that of Africa. In the environs of Modena we have neither the *Oxalis acetosilla* nor *Oxalis corniculata*, I have not therefore been able to make experiments upon them."

M. Morren in addition gives an account of some new observations which this communication had led him to make, and which proved to be in every respect confirmatory of the views of M. De Brignoli.

"The *Oxalis sensitiva* mentioned here by M. De Brignoli, and originally from China, was indeed named by M. DeCandolle from this fact *BIOPHYTUM* (*Biophytum sensitivum*), that is to say, *plant alive*, its leaves are pinnate like those of Sensitive plants. The East Indian *Averrhoa bilimbi* is another of the *Oxalideæ* in which the leaves are likewise excitable and mobile. The *Averrhoa carambola* has its petioles mobile, as

Bruce has shown* These approximations prove that the movement of the leaves of the true *Oxalides* may in fact extend to a multitude of species, since this genus is one of the most numerous†

During the great heats of the month of June, when the thermometer was at $+ 35^{\circ}$ (R) in the sun, the excitability and movement of the leaves were very evident in our three indigenous species of *Oxalis* *Oxalis acetosella*, *Oxalis stricta*, and *Oxalis corniculata* When the sun darts his rays in the middle of the day directly on the leaves of these plants, their three obcordate leaflets are level, horizontal, and so placed that the margins which are directed towards the point of the heart, or towards the very short partial petiole, nearly touch one another, so that then there is, so to say, no space between the leaflets This is the position of repose Now if we strike the common petiole with light but repeated blows, or if we agitate by the same means the entire plant, we see, after the space of a minute,—less if it be very hot, more if it be cool,—three phænomena take place

1 The leaflets fold themselves up along their midrib just like the moveable limb of the *Dionea muscipula*, in such a manner that their two halves approach each other by their upper surface, the movement therefore in this case is from below upwards, and it is a folding together

2 Each lobe of the leaflet bends inwards, so that outwardly and on its lower surface it presents a convexity more or less decided This is a movement of incurvation

3 Each partial petiole, although very short, bends itself from above downwards, so as to cause the leaflets to hang downwards, which then nearly touch each other by their

* Phil Trans vol lxxv p 356 An Account of the sensitive qualities of the tree *Averrhoa carambola*

† M Virey, in a paper entitled, "Quelques considérations nouvelles sur l'acidité dans les plantes irritables," (Journal de Pharmacie, Paris, 1839, No V 25e année, Mai, p 289,) has fallen into three mistakes in what he says of the irritability of the *Biophytum* and of the *Averrhoa* In the first place he confounds the two genera in making *Biophyta* of the *Averrhoa bilimbi* and *Averrhoa carambola*, which is not the case In the next place, the *Oxalis sensitiva* being the same plant as the *Biophytum sensitivum* of DeCandolle, it is by no means the stamina which are excitable, but the leaves, as all authors say Lastly, M Virey has taken the *Oxalis sensitiva* for a plant distinct from the *Biophytum*

lower surface around the common petiole which forms the axis. This last movement is similar to that which takes place in the evening at the time of the sleep of the plant, and which has caused these leaves to be called *dependent* (*folia dependantia*)

Of our three indigenous species, *stricta* and *corniculata* showed me these movements with the highest degree of energy, *Oxalis acetosella* has them less strong, but perhaps may have them as evidently when in flower, a time at which I have not observed it.

Every kind of exciting action provokes the same changes, as the wind, and especially a slight compression of the middle of the leaf, or of the place where the three partial petioles meet, between the thumb and fore finger.

In the botanic garden of the University of Liège I also observed two species with three folioles *Oxalis purpurea* (W.), and *Oxalis carnosa* (Mol.). The first, when placed in a hothouse, showed the phenomena of excitability in the highest degree. The three folioles, without considerably bending back their lobes by the movement of incurvation already mentioned, curved downwards so as to touch one another two and two by the half of their limb, by placing their inferior surface one against the other.

Oxalis carnosa is more sluggish. The old leaves were motionless, the young ones, especially those which clothe the upper part of the stalk, exhibit nevertheless the same excitability, but the movement of incurvation is also less evident in it.

In a sixth trifoliate species, *Oxalis tortuosa*, the leaflets were no longer entire enough to enable me to ascertain if it were equally excitable.

*Oxalis Deppei**, furnished with four leaflets, evinces an excitability much more decided than the other species mentioned.

* The *Oxalis Deppei* brought from Mexico to England in 1827, and figured by Mr. Loddiges in his 'Botanical Cabinet,' No. 1500, is the same species as that which has been described and figured by our learned colleague M. Lejeune in the Bulletin of the Academy, vol. 11 p. 334, 1835, by the name of *Oxalis zonata*. Known throughout England by its older name, I have thought it right to continue it. It is not from the Cape of Good Hope, but from Mexico.

above In its ordinary state, the leaflets, all quite open, quite flat, spreading out upon the same plane, nearly touch at their margins, beginning from the reddish zone, which then seems to form a continuous circle on a deeply divided leaf. But if you have just given the petiole some gentle filips, in a quarter or half a minute, when the sun shines upon the plant, you see the leaflets fold up along their midrib, from the base to the apex, then the two lobes curve inwards, and lastly the partial petiole bend from above downwards, so as to cause the leaflets to hang down. Two or three minutes after the filips the plant seems to be asleep.

A leaf teratologically developed with five leaflets exhibited the same fact. It is unquestionably the species in which these movements can be best observed.

These were the only species which were at my command. In all of them the movement takes place without a shock, without agitation, but little by little, insensibly, it can, however, be ascertained all the better, as between a leaf the leaflets of which are horizontal, and another where they are vertical, the difference at once strikes the eye.

Our indigenous species are too small for observing the organs of this mobility well, but *Oxalis Deppei* is well calculated for observation and anatomy.

As in all plants moveable from excitation, the organs of motion reside in the apparatus itself which moves. Now here the apparatus consists of 1 The blade itself of the leaf, an organ of incurvation, 2 The large midrib, 3 The partial petiole, the former being an organ for folding back, the latter an organ of incurvation.

Now the blade of the leaf is composed, above, of a cuticle with pinenchymatous cells, that is to say tabular-shaped (Meyen), beneath, of a cuticle with merenchymatous cells, swollen up, like bladders, with numerous small linear stomata between all the raised cells, so that one amongst them is often surrounded by six stomata, in the middle by a double diachyma, whose upper plane is formed of prismatic or ovoidal cells placed perpendicularly, and of such a size that upon the length of a single tabuliform cell of the upper cuticle (*derme*) there are six utriculi of the diachyma. The plane of the dia-

chyma is formed of ovoidal cells, placed transversely, and of such a development that two of them are equal in diameter to a merenchymatous cell of the inferior cuticle which is equal to three or four fifths of a tabular cell of the superior cuticle

It follows from this structure that the cells of the inferior mesophyllum are double the size of those of the upper mesophyllum. The diachyma is moreover very rich in chlorophyllum and in round clusters of crystals, occupying the axis of the cells.

It seems to me evident that analogy with the other plants which are moveable by excitation, should lead us to place the cause of the incurvation of the blade in the inferior mesophyllum, the cells of which by turgescence elongate the inferior pagina of the leaf, and thus cause the upper pagina or the mesophyllum to fold upwards. The cellular tissue is here also the essential organ of movement, and each cell a body turgescient by excitability.

The midrib is very large in this plant, it is three or four times larger than the secondary nerves, and it extends straight and rigid from the basis of the leaflet to its apex. It is transparent and juicy. This nerve reminded me of the structure which I discovered in former dissections in the *Dioræa muscipula*.

Its cuticle is formed of little cells as high as they are wide, nearly cubical, with very strong parietes. Four or five correspond in width to the diameter of a single infrajacent cell. Such a structure itself enables this cuticle to follow all the dilatations that its interior mass can undergo. Directly within this cuticle there occurs a cellular plane greatly developed, formed of large cells, irregularly merenchymatous, with strong parietes, and leaving between them passages, the section of which is a triangle. There is little chromule, but intracellular fluid in abundance. Each cell is the double of those of a more interior cellular plane, and the quadruple or the quintuple of those of the external cuticle. This plane of great cells has them four or five in a row. Then come towards the upper part of the midrib some chromuliferous cells, which immediately surround a channeled plane of vessels, a channel,

the hollow of which is directed upwards, and which is filled with little cells and sap vessels

This structure reminds us of that of the petiole of the *Mimosa pudica*. The distention of the great cells of the lower plane of the midrib must force the two half blades of the leaf to approach each other, and this enlargement, produced by excitability and allowed by the intercellular passages, thus becomes the proximate cause of the folding up of the two lobes of the leaflet of *Oxalis Deppei* all along the nervure. There is the same mechanism and a very analogous structure in the *Dionæa muscipula*.

There is no pulvinus at the base of the leaflets of the *Oxalis* as in the Mimosæ, but there is a peculiar organization in this part which answers the purpose of this organ. If we observe attentively how the leaflet is articulated to the petiole on the under side, we find that the midrib terminates in a crescent, the concave of which faces the petiole. The petiole in its turn ends in another crescent, the concave of which faces the leaflet, so that the partial petiole, which is so short as not to exceed a millimetre and a half, is terminated by two opposite crescent-shaped articulations, the convexities of which face each other. Thus much for the under part of the leaf.

As for the upper part, the two margins of the leaflet which converge at the base of the leaflet to form the point of the heart, become imperceptibly thicker and unite to form a kind of crescent-shaped bridle, whose concave is turned towards the leaflet. The common petiole receives in its turn the partial petiole by a crescent-shaped articulation, but which, in this instance, has its concave turned towards the leaflet, that is to say, it is a crescent parallel to the first. Between them spreads a red cuticle, which is strongly plaited crosswise.

The transverse section of this organ gives that of a depressed cylinder formed of a strongly resisting cuticle, consisting of ovoidal cells lying flatwise, the parietes of which are of the thickest. Then comes a fully developed layer of cellular tissue with cells plainly merenchymatous, forming at least a dozen rows. Each cell has a central mass of chromule. There are fewer rows of cells (from 8 to 9) towards the upper part of the partial petiole. In the centre of this, but a little higher

than the geometric centre, are the air vessels (tracheæ) below, and the sap vessels above, surrounded by smaller and more fully coloured cells

This organization is fundamentally that of the pulvinus of *Mimosa pudica*. When the merenchymatous cells of the cortical part of the lower zone are distended or turgescient, the leaflets are horizontal, when their turgescence stops and that of the cells of the upper zone predominates, the leaflets droop, as in the natural sleep of this *Oxalis*, and as takes place after it has been subjected to disturbance

At any rate, the excitability of the cellular planes and of each cell in particular, and the distention which is the manifestation of it, must be admitted to account for the different positions which the leaves of the *Oxalis* take when they are struck

The movement of the leaves of the *Oxalis*, although slower than that of the sensitive plants, is also not on that account less remarkable, it is even so much the more interesting to us, as, taking place in our indigenous plants, we can the better observe it, the physiological study of our national species hence obtains a new attraction, and the discovery of M De Brignoli and his pupils has led in its turn to the discovery of an analogy of structure between the leaves of the Oxalideæ and those of the Mimosæ, an analogy which could hardly have been expected, but which is fully proved by direct observation

The moveableness of *Oxalis* is the more singular, as M De Candolle has not been able to modify the sleep of these plants, either by means of darkness or light, whence he concluded that the movements of sleep and awakening were connected with a periodical disposition of motion inherent in the plant*. We see, however, that a simple blow makes the *leaflets when awake* take the posture of *sleeping leaflets*

M Virey, in his 'Considérations nouvelles sur l'acidité dans les plantes irritables †,' has made evident by the recapitulation of the species in which the movement of any organ has been observed, that most of them were acid, this is indeed a curious analogy to demonstrate, but which proves nothing, for we cannot see what connexion there should be between a thing

* Physiologie, vol II p 861

† Journal de Pharmacie, 1839, May, p 289

which is *acid* and a thing which *moves* In relation to this M Virey says that he knows no blue (alkaline) flowers in which there is any movement We will name to him a blue flower, *Goldfussia anisophylla*, in which the style is one of the most mobile* On the subject of these excitable plants, M Virey has quoted our observations on *Stylidium graminifolium*†, but he makes us say things quite contrary to what we have written Thus, we have nowhere said that the gynandric column of the Stylidicæ was articulated at its base by two opposite or antagonist fibres or muscles Never should we have allowed ourselves to look upon vegetable fibres as muscles, we said (at pp 15, 16, 17, and 18 of the memoir quoted) that these fibres exist all along the column, right and left We never said that the column was irritable at its base, for it is not so, it is irritable at its *elbow*, and we have figured it five times never did we say that we had found fecule in these muscles, as M Virey asserts, quite otherwise, we wrote (p 18) that the fibres had no influence on the movement, since when they were cut, the movement still took place What is in our memoir is this our idea is very clear, it is the feculiferous portion of the column which moves, and the same thing takes place in all the species of the genus *Stylidium* This is an irrefragable fact, whether it agree or not with received theories, signifies little, in the natural sciences facts go before all things, and it is by them alone that we can attain to truth

XLVIII — *An attempt to ascertain the Fauna of Shropshire and North Wales* By T C EYTON, Esq, F L.S

[Continued from vol iii p 29]

Additions to VERTEBRATA

Vespertilio Nattereri, Kahl (Reddish Grey Bat) One specimen is in my possession, taken at Eyton

Sorex araneus, Linn Since the publication of the former portion of this series of papers, the discovery of the Rev L Jenyns, that this

* Morren, Recherches sur le Mouvement et l'Anatomie du Style du *Goldfussia anisophylla*, 4to Brux 1839, avec 2 pl — Mem de l'Acad t xii

† Morren, Recherches sur le Mouvement et l'Anatomie du *Stylidium graminifolium*, Brux in 4to, 1838, Mem de l'Acad t. xi

species does not coincide with that so called on the continent, has been made known to the world, the name therefore which has been applied to it must be here adopted in the place of that before given, viz for *S araneus* read *S rusticus*, Jen

Sorex tetragonurus, Durer Jen (Square-tailed Shrew) I have lately captured one specimen of this shrew in the marshy meadows bordering the river Lerne between Longdon and Allscot, its length from the tip of the snout to the root of the tail is 3 inches

Arvicola pratensis Bail (Bank Vole) Several times taken near Eyton

Sula Bassana Linn (Gannet) A specimen has lately been brought to me alive, caught during a high wind quite exhausted it became so tame after a few days that it would take fish from the hand

INVERTEBRATA

Land and Freshwater Mollusca

Arion ater, Fer Common

Limax cinereus, Linn Common

Limax agrestis, Linn Common under stones and logs of wood in autumn

Vitrina pellucida, Mull Common

Succinea, Drap *Succinea amphibia*, Turton, Manual, and *S amphibia*, Drap, are two distinct shells but *S oblonga*, Turt, is *S amphibia*, Drap *Helix peregra*, Mont, is not either of these, but appears to be a true *Succinea* although quoted by Turton as a synonym to *Limneus pereger*, but is the shell figured by Pennant under the name of *Helix putris* With *S amphibia* Turt, I am unacquainted The synonyms of the British species of the genus which I have had an opportunity of examining will therefore stand thus —

Succinea amphibia, Drap *S oblonga*, Turt *Helix putris*, Mont Not uncommon about Eyton .

Succinea peregra *Helix peregra*, Mont *Helix putris*, Penn Common, adhering to water plants

Helix arbustorum, Linn Common .

Helix aspersa, Gmel Common in many localities, particularly on the walls of Beaumaris Castle, also near Rhoscelyn on Holyhead Island

Helix nemoralis, Linn Innumerable varieties of this common shell occur

Helix hortensis, Linn Occasionally occurs at Eyton

Helix rufescens, Mont Found on most sand hills near the sea

Helix hispida, Mont *H sericea*, Drap Common

Helix lucida, Drap Common

Helix radiata, Mont *H rotundata*, Mull, Drap Common

Helix ericetorum, Linn At Rhoscelyn and Towyn Merioneth common on stones and walls on the sea shore

Bulimus fasciatus, Mont *B acutus*, Mull Common on most sandy shores above high water mark, and where there is some slight vegetation

Pupa Secale, Drap Very common at Eyton in the autumn, adhering to the under side of logs of wood and stones

Cyclostoma obtusum, Drap Common on the Weald moors, adhering to water plants

Planorbis carinatus, Drap Common in ditches on the Weald moors

Planorbis vortex Mull Common in the same locality as the last

Planorbis contortus, Turt Also common on the Weald Moors

Planorbis nitidus, Mull Not so common as the foregoing species, but found in the same locality The *Planorbis nitidus* of Muller appears to be the *P complanata* of Drap, *P nitidus* of Drap is probably the *P contortus* of Turton and Linnæus

Planorbis marginatus, Drap Common at Eyton

Limneus magnalis, Linn Once taken at Eyton

Limneus palustris, Linn and Drap Common I also find a variety of this species not quite so robust, and never growing to so large a size as the true *palustris*

Limneus elongatus, Drap Once only taken near Watford in a peaty ditch

Limneus auricularius, Linn, Drap Common

Anchylus fluviatilis, Mull Common attached to stones in most streams in Shropshire

Anchylus lacustris, Mull Twice taken in a mountain stream near Capel Curig

Paludina impura, Lamk Common

Paludina similis, Jeff *P viridis*, Turt Common on the Weald Moors

Anodon cygneus, Lamk Common in pools and in the Shrewsbury canal

Anodon anatinus, Lamk Also common in the same localities with the last, the remaining species of this genus are exceedingly doubtful

Mysa Pictorum, Turt Common

Unio Ratana, Lamk Occasionally taken at Watford

Cyclas cornea, Linn Common

Cyclas calyculata, Drap 'The only locality I know for this shell in the district is in a marl pit near Hutton Grange

Pisidium obtusale Pf Common on the Weald Moors

Pisidium pusillum, Jen I have at different times taken two or three specimens of this shell on the Weald Moors

Pisidium nitidum, Jen Not very uncommon on the Weald Moors

Pisidium amneum, Mull Taken in the same locality with the last

XLIX — *On the production of Isinglass from Indian Fishes*
By Dr CANTOR, Corresponding Member of the Zoological Society*

IN the December Number 1838, of Parbury's Oriental Herald appears a letter 'On the Suleah Fish of Bengal, and the Isinglass it affords' the description of this fish I shall quote in the words of the anonymous writer "The Suleah Fish," he observes, "when at its full size, runs about four feet in length, and is *squaliform*, resembling the Shark species in appearance, but exhibiting a more delicate structure than the latter The meat of this fish is exceedingly coarse, and is converted by the natives, when salted and spiced into 'burtah,' a piquant relish, well known at the breakfast-tables of Bengal The bladder of the *Suleah* may be considered the most valuable part of it, which, when exposed to the sun and suffered to dry, becomes purely pellucid, and so hard that it will repel the edge of a sharp knife when applied to it These bladders vary from half a pound to three quarters of a pound avoirdupois in weight, when perfectly dry The *Suleah* Fish abounds in Channel Creek, off Saugor, and in the ostia or mouths of all the rivers which intersect the Sunderbuns, and are exceedingly plentiful at certain seasons "

Conceiving the great importance of the discovery of isinglass being a product of India, I was naturally anxious to examine the source, arising from a branch of natural history to which in particular I have devoted my attention, but from the general nature of the description, I was obliged to defer my desire of identifying the fish till some future opportunity should enable me to do so Quite unexpectedly, however, a few days ago, the last overland despatch brought me a letter from my valued friend Mr McClelland, a Corresponding Member of this Society, an extract of which, bearing upon the point in question, I lose no time in laying before the Society — ' I have now to mention what is of far greater importance in another

point of view, namely, that the Suleah Fish described in a recent number of Parbury's Oriental Herald is the *Polynemus Sele* of Hamilton. I have examined that species, and found an individual of two pounds weight to yield sixty five grains of pure isinglass, an article which here sells at sixteen rupees (17 12s) per lb. Refer to your dissections of *Polynemus*, mark those with large air-vessels to be isinglass, requiring no other preparation than merely removing the vascular membrane that covers them, washing with lime-water and drying in the sun. You know the size these fishes attain and the number in which they abound in the Sunderbuns, you also know the method of taking them, and can therefore state to what extent isinglass may be obtained in India. I have sent a paper on the subject to the Journal of the Asiatic Society*, which I will send you by the next overland despatch.

Perceiving by this that the subject has been taken up by a naturalist of Mr McClelland's rank, and that we ere long may expect his observations embodied in a paper from his hand, I think it sufficient to confine myself to a few general remarks upon those species of *Polynemus* which have come under my actual examination while I was attached as surgeon to the Hon Company's survey of the sea face of the Gangetic Delta.

The species best known is the *Polynemus risua*, Hamilton, *Pol longifilis* Cuvier, the Gupsee or Mango Fish of the Anglo Indians, this inhabits the Bay of Bengal and the estuaries of the Ganges, but enters the mouths of the rivers, even higher up than Calcutta, during the breeding season (April and May), when the fish is considered in its highest perfection and is greedily sought as a great delicacy. This species is the smallest, for its length seldom exceeds eight or nine inches, and one and a half to two inches in depth. *Polynemus aureus* and *Topsui* Hamilton, are species closely allied to this.

Polynemus sele, Hamilton, *P plebeus*, Broussonais, *P lineatus*, Lacépède, is the Suleah fish mentioned in Parbury's Oriental Herald, the same which Mr McClelland submitted to examination. This species, as well as another closely allied to *P quadrifilis*, Cuvier, which I have dissected, figured, and described, under the name of *P Salliah* (*Saccolih*), appears equally plentiful, in shoals, all the year round in the estuaries of the Ganges, and is appreciated by Europeans and natives for its excellent flavour. Both species attain a size from three to four feet in length, and eight to ten inches in depth.

* See the following article

In a paper which I had the honour of communicating to the Royal Asiatic Society*, the genus *Polynemus*, among others, was pointed out by me as forming an article of food fit for curing, and easily procurable in almost any quantity by the discovery that it produces isinglass, it has attained an additional interest, and I have no doubt the manufacture of this article will, when entrusted to judicious hands, form another valuable article of exportation from India

L — *On Isinglass in Polynemus sele, Buch, a species which is very common in the Estuaries of the Ganges* By J McCLELLAND, Esq, Assistant Surgeon†

THERE are nine species of *Polynemus*, or Paradise fishes, enumerated by authors, and although they are all pretty well described, I am not aware of any more valuable property being known regarding them than their excellence as an article of food, of which we have a familiar instance at this season in the *Pol paradiseus*, or Mango-fish, *Tupai Muchi* of the Bengalese

Buchanan has five species in his work on Gangetic Fishes, but three of these are small and probably varieties only of the *Tupai*, two of them, however are of great size and so common in the estuary of the Hoogly, that I have seen numerous hackeries, or bullock carts, conveying them to the Calcutta bazar, during the cold season. They are not confined to the estuary of the Hoogly, but probably extend to all the estuaries of the Ganges as Buchanan says they do, and we know that Dr Russell also describes two large species in his work long since published on the fishes of the Madras Coast

The very valuable production, *Isinglass*, having been recently found to be yielded by one of the fishes of the Hoogly by a writer in Parbury's Oriental Herald, it became an interesting object to determine the systematic name of the fish affording an article so valuable, and to learn as much as possible regarding its habits. Having procured a specimen of this fish from the bazar I was surprised to find it to be a *Polynemus*, or Paradise fish, although the writer alluded to described it as resembling a Shark. My surprise was not that a person unacquainted with fishes should compare it to a Shark, or to anything else, but that a nearly allied species to the Mango fish should contain a natatory vessel of such size and value,

* Published in the Journal of the Royal Asiatic Society of Great Britain and Ireland, No ix, August 1838, p 165

† From the Journal of the Asiatic Society of Bengal, No 87, p 203

while that organ is quite absent in the Mango-fish itself, though a general character of nearly all others

I had come to the determination never to describe single or detached species of fish, but as the object of this paper is to elucidate the commercial side of a question already before the public, I shall not pretend to offer any remarks on the scientific part of the subject, which is indeed beyond my province, as my observations have hitherto been confined to the fresh water species of India

The species affording the Isinglass is the *Polynemus sele*, Buch, *Sele*, or *Sulea*, of the Bengalese, described, but not figured, in the Gangetic Fishes, but if Buchanan's drawings had not been placed under a bushel since 1815, probably this useful discovery would have been sooner made, and better understood by the writer in Parbury's Oriental Herald, to whom we are indebted for it

The figure [given in the Journal of the Asiatic Society of Bengal,] from Buchanan's unpublished collection at the Botanic Garden, conveys an excellent representation, about half size, of a specimen from which I obtained 66 grains of Isinglass but as the writer in Parbury's Oriental Herald states that from half a pound to three quarters of a pound is obtained from each fish, we may suppose either that *P sele* attains a much greater size than 24 pounds, the limit given to it by Buchanan, or, that the Isinglass is also afforded by a far larger species, namely *Polynemus teria*, Buch or *Teria bhangan* of the Bengalese, *Maga jellec* of Russell, which Buchanan was informed sometimes equals three hundred and twenty pounds avoirdupois, and which I frequently have seen of an uniform size, that must have been from fifty to a hundred pounds at least, loading whole cavalcades of hackeries at once on their way to the Calcutta bazar, as I have already stated, during the cold season, when they would consequently seem to be very common

Although the sound, or natatory vessel is the part of the fish that would afford the principal inducement to form fisheries, one of the obligations that speculators should be obliged to enter into with the Government is, to cure all parts of such fishes as might be taken for their sound. Considering the scarcity of fish in many parts of India, and the great, I may say unlimited demand for it in some parts of the country even when badly preserved, as well as the excellence of the flesh of all the *Polynemi*, the curing of these fishes might prove no less profitable to the parties themselves, than it would unquestionably be to the country. I was happy to find the attention of the Royal Asiatic Society directed to the subject of curing fishes in

India by Dr Cantor, (vide Proceedings, 21st April, 1838) but a something was then wanting to be known in order to give a direct inducement to the undertaking* I therefore regard the discovery of the *Ichthyocolla* of commerce in one of the larger *Polynemi* of India as a circumstance eminently calculated to direct attention to a promising and almost unlooked for source of enterprise We first of all require to know whether more *Polynemi* than one afford it, and to be fully acquainted with the habits and the methods already employed for taking such as do *Polynemus sele*, Buch is the species I examined and found to contain it, but this species is supposed to be a variety only of *Polynemus lineatus*, which is very common on all the shores to the eastward, it therefore becomes a question of some importance to determine whether *P lineatus* yields the same valuable article, and if it be really common to the eastward, if so, it seems strange that the Chinese should send for it to the Hoogly Next, do the *Pol Emor* and *Pol plebeus*, supposed by Buchanan to correspond with his *Sele*, contain the same valuable substance? and do either of Russell's species, namely, the *Maga booshee* and *Maga jellee* (Indian Fishes, 183, 184,) yield it? These are questions easily determined along our coasts by merely opening such fish as correspond with the one figured, and ascertaining whether they contain an air vessel or not, and whether that vessel if present be large or small Mergui, Batavia, Singapore, Tranquebar, Madras, and

* Should Dr Cantor still be in London, I would recommend those who may be interested in the important question of Isinglass to consult him, as no one is so competent to afford information regarding the fish by which that article is yielded in India He will, I am confident, on a re-examination of his notes regarding the *Polynemi*, readily distinguish those with large sounds, and be able to afford more valuable information regarding their habits, and the quantities in which they are procurable, than could be expected from any one who had not devoted his thoughts to the subject, during a survey of the place in which these fishes occur I am not sure that the species of *Polynemus* Dr Cantor particularly refers to in his paper as the *Salliah*, or *Saccolih*, is not the very fish that affords Isinglass, if so, it appears to be considered by Dr Cantor as a new species, and his notes will probably afford all that it is essential to know regarding its habits Thus, as Sir J E Smith somewhere observed, "the naturalist who describes a new species, however trifling it may seem, knows not what benefit that species may yet confer on mankind"

In an interesting account of Kurachoe by Lieut Carlross, read at the last anniversary Meeting of the Bombay Geographical Society, cod sounds and sharks' fins are mentioned among the exports from that place, and fishing is said to be carried on to a considerable extent along the coast of Sind As however the Cod, *Morhua vulgaris*, Cuv, is quite unknown in the Indian Seas, the species from which the sounds alluded to by Lieut Carlross are taken are no doubt *Polynemi*, the larger species of which are sometimes called by the English, Rock-Cod It will be curious to learn if the Chinese have monopolised this trade on the coast of Sind as well as in the Hoogly

Bombay are points at which observations might be made. This question may be so easily ascertained, that it is hardly worth forming a conjecture about it, but if any of the species common to the coasts of the Eastern seas possessed so valuable a property, the chances are that it would have been long since discovered. It is therefore probable that the large gelatine sound will be found to be peculiar to *Pol sele*, and perhaps *Pol teria*,* Buch both of which seem to resort chiefly to the Gangetic estuaries at certain seasons, particularly during the North-east monsoon, when it is easy to imagine that the shelter afforded in those estuaries at that season, might account for many peculiarities which their ichthyology appears to present, compared with that of open coasts. It is during the cold season that the two gigantic fishes above mentioned appear to be caught in most abundance, a circumstance the more favourable to any improved operations that might be resorted to with a view to convert them to useful purposes. Whether both contain the same valuable substance, I am unable to say, having as yet only examined *P sele*.

GEN —POLYNEMUS

Two fins on the back with long filaments attached to the sides in front of the pectoral fins. Opercula covered with scales. preoperculum serrated behind. Example. The common Mango-fish of Bengal.

YIELDING ISINGLASS

P Sele, Buch Plate—

Sele, or *Sulea* of the Bengalese

Five filaments, the first reaching from the front of the pectorals to midway between those fins and the anal, the other filaments progressively shorter, no streaks on the sides. lateral line deflected on the lower lobe of the caudal fin. The fin rays are as follows —first dorsal seven, second dorsal fourteen, pectorals thirteen in each, ventrals each six, anal twelve or thirteen, caudal twenty (?). The teeth are very fine, continuous below round the edges of the jaws, but interrupted at the anterior part of the upper jaw, behind which a small detached group of palatine teeth are placed on the vomer.

The liver consists of an elongated left lobe and a short right one, under which the gall bladder is situated. The stomach is a short muscular cul-de-sac both orifices of which being placed at the anterior extremity, from which numerous small *cæcæ* are given off, the intestine extends straight to the vent, in all these respects it corresponds nearly with *P paradiseus*. The air vessel, which is quite absent

* *P quadrifilis*, Cuv. *P tetradactylus*, &c and probably refer to the same

in the latter, and on which the peculiar value of this species seems to depend, is a large spindle-shaped organ about half the length of the fish, thick in the middle and tapering toward the extremities, where it ends in front by two, and behind by a single tendinous cord, similar small tendinous attachments, about twenty two in number, connect it on either side to the upper and lateral parts of the abdominal cavity. This organ, which is called the sound, is to be removed opened and stript of a thin vascular membrane which covers it both within and without, washed perhaps with lime water and exposed to the sun, when it will soon become dry and hard, it may require some further preparation to deprive it of its fishy smell after which it may be drawn into shreds for the purpose of rendering it the more easily soluble. The fish which I examined weighed about two pounds and yielded about sixty-five grains of Isinglass, not quite pure, but containing about 10 per cent of albuminous matter, owing perhaps to the individual from which it was taken being young and out of season, and not above a tenth part of the ordinary size of the species. But the solution after having been strained appeared to be equal to that of the best Isinglass, which costs in Calcutta from twelve to sixteen rupees a pound. As the subject thus seemed to be of consequence, I gave a portion of the substance in question to Dr O Shaughnessy for its chemical examination.

Calcutta, 31d May, 1839

LI — *A Supplement to the Synopsis of the Fishes of Madeira**
in the Second Volume of the Transactions of the Zoological
Society By the Rev R T LOWE .

Fam PERCIDÆ

GENUS CALLANTHIAS

Gen. char — Head scaly, except the short muzzle before the eyes, teeth as in *Anthias*, Bl preopercle perfectly entire, opercle with two flat adpressed spines, lateral line high up, near the back, and ending at the end of the dorsal fin, which is even or continuous, branchiostegous membrane with six rays.

CALLANTHIAS PARADISÆUS A most elegant little fish, in general habit and colouring resembling *Anthias sacer* Bl, but without the produced third spine of the dorsal fin. Its analogies are singularly complicated, but its affinities are truly Percidous. By Bloch it might

* Read before the Zoological Society, May 28, 1839

have been arranged either in *Bodianus* or *Cephalopholis*, Bl, but it is really inadmissible into any well defined or constituted modern genus It is almost as rare as beautiful

Fam BERYCIDÆ

Genus BERYX, Cuv

BERYX DECADACTYLIUS, Cuv *B corpore ovali, lato, profundo, altitudine longitudinem capitis superante, dorso elevato, arcuato, gibbo, ventre prominente basi pinnae dorsalis elongato, pinnis pectoralibus haud brevioribus oculis maximis operculi angustae carina obscura; osse humerali angusto, margine posteriore recto, verticali*

D 4 + 18 — 20, Vs 1 + 10, &c

B decadactylus, Cuv and Val, Hist III 222

B splendens, nob quoad icon Tab III in Cam Phil Trans, Vol VI Part 1 haud textus

When I published *B splendens* as a new species in the Cambridge Transactions, I was unacquainted with the present fish, though it is scarcely perhaps less common than the former I consequently did not discover till long after, that the figure intended for my *B splendens* had been inadvertently taken by Miss Young from an individual of *B decadactylus*, Cuv, of which it offers the more obvious peculiarities The true *B splendens*, therefore, yet remains unfigured, and till an opportunity presents of supplying this deficiency in the "Fishes of Madeira," I subjoin its true specific characters, contrasted with those of *B decadactylus*

B SPLENDENS *B corpore oblongo, altitudine longitudinem capitis haud æquante dorso recto basi pinnae dorsalis brevi, pinnis pectoralibus brevioribus oculis magnis, operculi lati carina prominente osse humerali dilatato, margine posteriore arcuato, obliquo*

D 4 + 13 — 15, V 1 + 10 — 13 (1 + 11 fere), &c

B splendens, nob Proceed Zool Soc 1833 1 142 Cam Phil Trans VI 1 197, excl icon — Syn Mad Fishes in Trans Zool Soc Vol II p 174

Trachichthys pretiosus, nob

Hoplostethus mediterraneus, Cuv and Val IV 496 t 97 bis Rariss

This fish is unquestionably congeneric, if it is not even still more closely allied with *Trachichthys australis* of Shaw Hence the above adoption of the older generic appellation, affording opportunity for the substitution of a less restrictive specific title, better suited to a fish proved by the occurrence of two individuals in these Atlantic seas not to be peculiarly Mediterranean

To the Sub-Percidous family *Berycidae* belongs also *Polymixia*,

nob Cam Phil Trans IV 1 198 t IV —Syn Mad Fish pp 178, 179

Fam TRIGLIDÆ

Trigla lineata, L Cuv and Val Hist IV 34 Yarrell, Brit Fish 1 46 Rariss

A single individual only has occurred

Fam SPARIDÆ

Pagellus rostratus, nob —Syn Mad Fish 177

Reference to the excellently characteristic figures of Rondelet and Salviani has satisfied me that this is merely *Pagellus erythrinus*, Cuv and Val

Fam CHÆTODONTIDÆ

Pimelepterus Boscii, Lac —“Cheiroco” or “Xarroco” —Cuv and Val VII 258 t 187 Rariss

Fam SCOMBRIDÆ

Thynnus Albacora —“*Atum Albacora*” —*T corpore elongato, postice attenuato pinna anali secundaque dorsali antice longi falcato-productis pectoralibus ad medium secundæ dorsalis attingentibus ore oculisque parvis*

Tunny, Penn Brit Zool Ed 1 iii 266 No 133 t 52 excl syn An L'Auxide de Sloane Scomber Sloane, Cuv and Val Hist VIII 148, 1 c Albacore Sloane, Hist of Jam 1 t 1 f p 28? Sat vulg

The length of the narrow produced fore-part of the second dorsal fin varies from one-sixth to one fourth part of the whole length of the fish, that of the pectoral fins is from one fifth to one fourth part of the same, and their tips reach to the middle of the second dorsal fin Thus, in this latter point it is intermediate between the common Tunny (*T vulgaris*, L) and the following new species (*T obesus*, nob), approaching most the latter

Pennant's figure is at least a tolerable representation of this very distinct species, agreeing with it in its main points of difference from the true *T vulgaris*, L It may be hoped that the attention of British Naturalists will be directed to this point The proper season for the Albacora in Madeira is September and October

THYNNUS OBESUS —“*Atum Patuda*.” —*T corpore abbreviato obeso pinnis acutis, pectoralibus ad finem secundæ dorsalis attingentibus oculis magnis*

Vulgaris

This fish is constantly distinguished by the fishermen from the common Tunny or “*Atum Rabilha*” (*T vulgaris*, L) by the larger

eye, and shorter thickset figure The pectoral fins vary from one-fourth to nearly one-sixth part of the whole length, their points reaching to the end of the second dorsal fin In *T vulgaris*, L the tips of the pectoral fins reach only to the end of the first, or to the beginning of the second dorsal fin

T obesus is in greatest abundance earlier in the summer than *T Albacora* In size it ranges next below *T vulgaris*, L, not however attaining above half the extreme size of that species, nor much exceeding the full size of *T Albacora*

Thynnus Alalunga, Cuv and Val — "*Atum Avoador*" — Cuv and Val Hist VIII 120 t 215

Orcynus Alalunga, Risso, iii 419 *Vulgaris*

No difficulty can occur in the recognition of this species, from the great length of the pectoral fins, which are one-third part of the whole length, and reach to the end of the anal fin or to the first spurious finlet behind it Its proper season is said to be January

Thyrsites acanthoderma — "*Escolar*"

Aplurus simplex, Syn Mad Fish 180

This is the fish called in my Synopsis *Aplurus simplex* It is a true *Thyrsites*, Cuv in every respect, except the structure of the skin, a peculiarity which seems insufficient, in the absence of all other characters, to warrant its generic separation *

Prometheus atlanticus, nob — "*Coelho*"

This also is again here mentioned only for the sake of remarking, that further observations have gone far to prove the Maderan fish to be specifically distinct from both *Gempylus Prometheus* and *G Solandri* of MM Cuvier and Valenciennes, whose synonyms should therefore be expunged

Gen APHANOPUS, nob

Gen Char — Form as in *Lepidopus*, elongate much compressed like a sword-blade, naked, but with a short keel on each side, towards the tail

Muzzle and teeth as in *Lepidopus* (Gouan), but the palatines unarmed

Dorsal fins two, nearly equal Anal fin as in *Lepidopus*, but with a strong sharp spine instead of a scale before it, a little behind the vent No trace or rudiment of ventral fins

APHANOPUS CARBO — "*Espada preta*" Rariss

Of this most curious new genus a single individual only has yet

* By an error in the punctuation, some descriptive observations at the bottom of page 180 of my synopsis (Trans Zool Soc, vol ii), relating to this fish, have been converted into a specific character

occurred The whole fish is of a dark coffee colour, approaching to black, and has in form so close a general resemblance to *Lepidopus argyreus*, Cuv, that it might well be taken hastily for a mere variety of that fish

Tetragonurus atlanticus, nob

Differs from *T Cuvieri*, Cuv and Val, XI 172 t 318 chiefly in the longer head, much larger eye (nearly twice as large in proportion to the whole length), greater width between the eyes, teeth twice as numerous, in the upper jaw thicker body, longer pectoral fins higher (twice as high) first dorsal fin, and inequality of its spines Having however, seen only a single individual I forbear to characterize it more distinctly, especially since of *T Cuvieri* so few examples have as yet occurred, and that even MM Cuvier and Valenciennes appear to have taken their figure from one which was imperfect in the caudal fin at least The first dorsal fin is described by MM Cuvier and Valenciennes as having fifteen spines, but twenty-one are figured in the plate

The following is the fin-formula of *T Cuvieri*, according to Risso, and MM Cuv and Val

"1st D 18, 2nd D 1, 12, A 1, 11, P 16, V 1, 5, C 36"
—Risso Hist

"1st D { ^{15 in text,}
 { _{21 in fig} } 2nd D 1 + 13, A 12, P 3, V 3, C 3, B
M 5"—Cuv and Val Hist

That of *T atlanticus* nob is

1st D 15, 2nd D 11, A 11, P 16 V 1 + 5, C $\frac{7+VIII}{7+VII}$,
B M 5

The true affinities of this fish are certainly rather to be sought among the Mackerels (*e g Thyrsites*) than the Mulletts Its relation to the *Mugilidae* is, indeed, one merely of a faint analogy

Xiphias gladius, L — '*Peixe Agulha*'

The ordinary Sword-fish of Madeira is truly the common *Xiphias gladius*, L

I have heard, however, of "another sort, with a bayonet or spit-like beak," called "Peto," which may perhaps have been a *Histiophorus* or *Tetrapturus*

SERIOLA DUBIA Rariss

A single individual only has occurred, which I am unable to identify with any of the species enumerated by MM Cuv and Val The second dorsal fin is produced in front into a point, five-eighths the depth of the body beneath The sides of the tail are sufficiently distinctly keeled, and there is no temporal band In the first of

these characters it comes nearest *S Rivoliana* or *S falcata* Cuv and Val , differing, however, from both, principally in the points in which they are said to agree with *S Dumerili*, Cuv and Val With *S Lalandi*, Cuv and Val , it agrees in the two latter points above-mentioned , but differs in the produced second dorsal and anal fins , *S Lalandi* appearing from MM Cuvier and Valenciennes' description not to disagree in this respect with *S Dumerili*, Cuv and Val The individual described measured two feet and a half long

Lampris lauta For ' Vertebrae 69' and " Vert 49," in the specific character and following formula of the *Lampris lauta*, p, 183 Of the Synopsis of Fish Mad (vol II Trans Zool Soc) read, Vertebrae 45 , and in the seventh line of the next page, for " six vertebrae more," read " two vertebrae more "

Fam CORYPHÆNIDÆ

Coryphæna hippurus Cuv and Val ? ' *Donado macho* ' —Syn Fish Mad 183

This fish agrees with *C hippuroides*, Raf , according to the brief account transcribed by MM Cuv and Val , in having a row of larger dusky spots along the ridge of the back on each side at the base of the dorsal fin, which is itself immaculate, whilst the anal fin is also somewhat high and pointed in front In these three points it is at variance with MM Cuvier and Valenciennes' elaborate description of their *C hippurus*, L The individual described, however, by these consummate Ichthyologists was a male , whilst the only three which I have been able to examine closely, proved on dissection to be females, though commonly supposed by the Maderan fisherman to be the male of *C equisetis*, L Hence the Maderan fish, whether identical or not with the obscure and doubtful *C hippuroides*, Raf , is for the present better referred to *C hippurus*, L Sufficient ground appears for the suspicion that the above differences may be only sexual But were it otherwise, they would alone scarcely warrant its specific discrimination

CORYPHÆNA NORTONIANA —" *Delfin* "

This is a deeper fish than the preceding, in proportion to its length, with the front much steeper and bluffer , indeed, nearly vertical , the Dorsal fin beginning also somewhat forwarder In the fin-formulæ, and number of the vertebrae (31), the two agree , and I have seen too few individuals at present to decide whether they really are distinct, or only so in sex But for its spotted body, I should be greatly tempted to refer it to the imperfectly known *C imperialis*, Raf (See Cuv and Val , Hist 9, 286) In this uncertainty as to

both rank and synonyms, less ultimate confusion will result from a distinct specific name, applied provisionally, than from a doubtful reference. It is therefore called after the Honourable C E C Norton, to whose able pencil I was first indebted for a knowledge of the fish. Two other supposed individuals have since occurred, of which, however, one was unfortunately neglected, and the other had been too much injured by a blow, beating in the interparietal crest, to be fully satisfactory. This last individual, taken November 22nd 1838, was apparently a male, but I could not satisfy myself completely even on this point, and infer it only from my inability to discover any trace of the ovaria.

Coryphæna equisetis, L. 1 447 —“Dourada,” *D femæa*” or “*D amarælla*” —*C equisetis*, Cuv and Val, 9, 297, t 267

This may at once be distinguished from the foregoing species by its unspotted body marked only by a few scattered clear but extremely minute black specks very different from the diffused pale, dusky, larger spots of the preceding. The pectoral fins are also very short, the dorsal fin with fewer rays (53—55), the number of vertebræ greater (33), the form deeper and less elongated than even in the first species here recorded. It also is a smaller fish. Being our commonest species, I have seen numerous examples, but none exceeding two feet in length. The average length is very uniformly from twenty to twenty-two or twenty-three inches.

This fish, which is the commonest of the “Dourados” of Madeira, differs from *C equisetis*, L., as described by MM Cuv and Val, under the name of *C equisetis*, only in the head being rather longer than high, instead of higher than long, in the dorsal fin being lower in its highest part, and also lower *before* than *at* its hinder end, and lastly in the profile being oblique from the beginning, whilst in *C equisetis*, Cuv and Val, “il monte d abord verticalement sur le tiers à peu près de son contour.” The first three discrepancies might well be merely due to slightly different modes of measurement. The latter is less easily accountable, for in this Maderan fish at least, of which I am well acquainted with both sexes, I find nothing to confirm M Dussumier’s observation, that a greater height of the interparietal crest is characteristic of the male in *Coryphæna*. See Cuv and Val 12, Pref p. vii.

Pompilus Rondeletii, Will 215, t O 1, f 6

Centrolophus pompilus, Yarr 1, 158

———— *pompilus*, Cuv and Val 9, 334, t 269

———— *morio* (Lacep) Ib 342 Rariss

Two examples have occurred during the writing of this paper,

the first was uniformly blackish, without spots or marks, thus answering to *Centrolophus Morio* of Lacepède the second individual was smaller, and was marked precisely as in MM Cuvier and Valenciennes' figure (t 269) of *C pompilus*

I have no hesitation in uniting both these fishes, with their respective synonyms, under the name long since applied by Willoughby to designate the species, although by him employed especially in reference to the second state or variety abovementioned, which also was the variety originally described by Rondeletius

Pompilus Bennettii

Leirus Bennettii, nob in Cam Trans VI 1, 199, t V —Syn Mad Fish p 179

Centrolophus ovalis, Cuv and Val IX 346

———— *crassus* Ib 348

The genus *Leirus* proves identical with *Centrolophus* Lac, which in its turn if not intolerable in itself (see Cuv and Val IX 331) must yield precedence to the prior claims of *Pompilus*, Rond The species described by the Ichthyologist of Montpellier, (*Centrolophus pompilus*, Auct) ought, on the other hand as long ago by Willoughby, to be called *Pompilus Rondeletii*

Brama Rau, Bl 'Freira' —Syn Mad Fish p 179

The true affinities of this fish are most assuredly Scombridal, or to speak more strictly, Coryphænid

It was in reconsidering those of *Brama*, and in reaching this conclusion, that I was first led to detect the true affinities and synonyms of *Leirus* It was not till convinced of the necessity of placing *Brama* next to *Pompilus* (*Centrolophus*, Lac) that I discovered *Leirus Bennettii* to be a genuine species of this last named genus

So valuable are these studies of affinities, and thus do even errors often lead to valuable truth I was not wrong, however, in associating *Leirus Bennettii* with *Brama*, but in not referring sooner it, or rather both, to the neighbourhood of *Pompilus*

Fam ZENIDÆ

Zeus Faber

Fam MUGILIDÆ

MUGIL MADERENSIS 'Tainha de mode'

This is the fish published, in the former part of this list, under the name and with the synonyms of *M Chelo*, Cuv Comparing it, however, more closely with the description of *M Chelo* in the eleventh volume of MM Cuvier and Valenciennes Histoire, I find the following principal discrepancies in the Maderan fish

1 The produced scaly appendages at the base of the first dorsal fin extend considerably beyond the base of the fourth spine

2 The maxillary is but very slightly S-like

3 The upper lip is by no means peculiarly thick and fleshy, but rather the contrary

4 It is a shallower less deep fish in proportion to its length

5 The tongue is altogether smooth, without any "asperités" whatever at the edges or anterior end of the "arête," which cannot be called 'très-aigue'

6 The palate also is entirely smooth not papillose near the vomer

7 A conspicuous bright metallic brassy spot on the opercula as in *M auratus*, Cuv and Val

It differs, however essentially from this last named species, and from *M breviceps*, Cuv and Val, in the exposure of the ends of the maxillary

Fam Gobiidæ

Having considerably extended my list of species, as well as rectified some errors in the nomenclature of others, I subjoin a complete enumeration of the Maderan species of this family hitherto discovered

Blennius gattorugine Will Cuv and Val IX 200 Will Ichth 132 t H 2 f 2 —Yarr 1 226 Rariss

A single individual only has occurred

Blennius palmicornis, Cuv and Val XI 214 t 320 Syn Mad Fish 185 Vulgaris

Blennius Artedu Cuv and Val XI 231 — *inaequalis* nob Synops Mad Fish 185 haud Cuv et Val Rarior

This is the little fish which, being formerly known to me only by a sketch, I had erroneously supposed to be referrible to *B inæqualis*, Cuv and Val On better acquaintance it however proves their *B Artedu*, and is indeed a most distinct and well marked little species, scarcely exceeding two inches in length, and at once characterized by its active lively habits, its light tawny brown or yellowish olive colour, sprinkled all over with numerous minute white specks or dots, and the hollow, triangle shaped, ciliate, occipital crest

Blennius parvicornis Cuv and Val XI 257 Syn Mad Fish 185 Rariss

Of this, as formerly of *B Artedu*, I have no means of judging, except from some notes and a drawing taken by Miss Young, July 10th, 1835 during my absence from the island My friend Mr. Yarrell has, however examined the individual from which these were taken, and on his accuracy I rely entirely for the correctness of the

above name or reference I had before supposed it to be undescribed, calling it *B strigatus*

Pholis lævis, Flem Cuv and Val XI 269 Yarr 1, 230 Syn Mad Fish 185 Rarior

I cannot help suspecting that MM Cuvier and Valenciennes' Maderan specimen at least, discovered by my friend Henry Richardson, Esq, of Aber Hirnant North Wales, of *Blennius trigloides*, Cuv and Val XI 228 is really nothing but this state or variety of *Pholis lævis*, which differs from the ordinary European fish only in having five or six distinct dark blotches or "demi bands" along the back I have hitherto met with no other fish beside the present answering at all to their description of *B trigloides*, whilst this state of *Pholis lævis*, although somewhat rare, is by no means so uncommon as to have been likely to escape Mr Richardson's unwearied assiduity

Salarias atlanticus, Cuv and Val XI 321 Syn Mad Fish 185 Vulgaris

Tripterygion nasus, Riss Cuv and Val XI 409 Syn Mad Fish 185 Rariss

GOBIUS NIGER β nob

—————, L Syn Mad Fish 185

Gobius Maderensis, Cuv and Val XII 55 Rarior

I believe this to be a mere variety or state of the common European *G niger*, Cuv and Val, analogous to the above-mentioned Maderan state of *Pholis lævis*, Flem

GOBIUS FRIPPIATUS, *G fuscus, maculatus et punctatus capite nuchaque nudis, hac sulcata pinnarum pectoralium dorsaliumque radius haud productis squamis magnis*

D 1^{ma} 6, D 2^{da} 12, A 11, P 19 V 5, C $\frac{5 \text{ v } 6}{5 \text{ v } 6} + \text{XV}$, B M 5 Rariss

Of a nearly uniform brown colour, a little paler on the belly, with a row of darker rich brown patches along the sides, and above these numerous scattered smaller spots Head spotted The spots on the head and fore part of the body are ocellate or surrounded by a ferruginous or yellow ring The eyes are scarcely a semidiameter apart The ventral fins are united, but by a very low membrane in front Length of the only individual which has hitherto occurred, five inches It appears sufficiently distinct from all the described European species by its naked head and nape

FAM LOPHIDÆ

CHEIRONECTES BICORNIS *C hispidus, setis furcatis, nudus sex-appendiculatus, pallide ruber, punctulis fuscis conspurcatus*

fronte super oculos bicorni, cornu anteriore distincto, recurvo, posteriore gibboso-cristiformi, filamento intermedio inconspicuo brachius pectoralibus ventralibusque exsertis

D 12, A 7, P 10, V 5, C $\frac{1+I}{1+I} + V$

A single individual only has occurred of this pretty little species, which in the foregoing characters appears distinct enough from all enumerated by MM Cuv and Val, approaching perhaps, nearest to *Ch furcipilis pardalis*, or *coccineus*. It was only one and three-fourths of an inch long and seven eighths of an inch deep. The whole fish is strongly scabrous to the touch.

Fam LABRIDÆ

Crenilabrus caninus, nob Synops 186

A most remarkable variety of this fish has the preopercle perfectly entire, invalidating thus completely the generic character. This state of the species appears permanent, and independent of age or size, whilst it is wholly unaccompanied by other marks of difference or indications of disease. It is rare comparatively with the normal form.

Crenilabrus luscus, nob in Syn Mad Fish 187, nec Yarrelli nec Linnæi

This also proves distinct from Mr Couch's Scale-rayed Wrasse (*Acantholabrus Couchi*, Cuv and Val 13 248), to which, as figured by Yarrell for the *Labrus luscus*, L (a true *Labrus*, according to Valenciennes,) I had formerly referred it. A still nearer ally appears, however, to be *Acantholabrus Palloni*, Cuv and Val 13 243 (*Crenilabrus exoletus*, Risso, haud *Labrus exoletus*, L). From this it differs in the extension up between each of the spines of the dorsal and anal fins of generally four of the large scales into a curious distinct and moveable imbricated appendage, in the large dark spot or patch on the hinder end of the spiny portion of the dorsal fin, in having two dark spots on each side at the base of the caudal fin, one on the dorsal, and another fainter on the ventral line and lastly in the general colour. In the first and last of these four points, it agrees better with *Acantholabrus Couchi*, Val (*Crenilabrus luscus*, Yarr, Brit Fish 1 300), but it differs in the other two, is only half the size, and whilst the dorsal and the anal fins have severally one spine less, the dorsal has one soft ray more.

LABRUS RETICULATUS

This fish cannot be at present safely referred to the Ballan Wrasse of British Authors (*Labrus maculatus*, Bl), Yarr 1 275, although

in size and form of body, no less than in the peculiar lowness of the spiny portion of the dorsal fin, and abrupt production of the soft part of the same, and of the anal fin, as well as in the number of the rays of all the fins, there is a strong agreement. It will, I think, however, ultimately prove merely a dark variety of that species. The colour is peculiarly sombre, being a dark brown approaching on the back almost to black, the whole beautifully reticulated with dark chesnut brown lines, forming a border to each scale, and leaving the centre pale. The preoperculum was scaly. A single individual occurred in March 1838, and measured sixteen inches in length. Its fin formula was,

$$D\ 19 + 11, A\ 3 + 9, P\ 14, V\ 1 + 5\ C\ \frac{4 + \overline{I + VI}}{3 + \overline{I + V}}, B\ M\ 5$$

This individual has been deposited in the Society's collection.

JULIS MELANURA *J. oblongus postice nigrescens capite superne dorsoque olivaceo fuscis lateribus perpendicularitate strigatis, strigis posterioribus nigricantibus pinnae dorsalis antice altiores rudius tribus primordialibus longioribus, operculique angulo lato truncato, basique primarum pectoralium caeruleo-nigrescente notatis pinna dorsali analique fasciatis basi nudis, caudali rotundato nigricante squamis parvis dente solitario majore ad canthum oris utrinque, antiorum porrecto*

$$D\ 9 + 12\ A\ 3 + 12\ P\ 14 + 15, V\ 1 + 5, C\ \frac{4 + VI}{4 + VI}, M\ B\ 6, \\ \text{Vert}^e\ 25$$

Julis speciosa nob. in Syn. Mad. Fish. 186. haud Rissoi.

———, Cuv. and Val., Hist. 13. 375, quoad tantum exemplum *Canariensis*, et forsan quidem *Maderensis*.

On re-examination and a close comparison of this fish with MM Cuvier and Valenciennes' description of the true Mediterranean *J. speciosa* of Risso, I find that it is properly distinct, although a Canarian individual at least of it has been referred by Valenciennes, as the Maderan fish was formerly by me, to Risso's species. It differs chiefly in the elevation of the three first rays of the dorsal fin, the spot on which is small not large, in the deep blackness of the caudal fin and hinder part of the tail or body, and, lastly, in being of considerably larger size (8–10 inches in length) than the true Mediterranean *J. speciosa*, Riss. Not having met at present with any other fishes in Madeira which agree so nearly as *J. melanura* with that species, I cannot help suspecting that in M. Valenciennes' Maderan specimens of his *J. speciosa* may exist the principal peculiarities which he has expressly noted in Mr Webb's Canarian example, and which are precisely those of *Julis melanura*.

ACANTHOLABRUS IMBRICATUS *A pinna dorsali analique basi squamosis, squamis subquaternis, bractearum modo imbricatis, inter spinas assurgentibus dorsalis parte spinosa postice unimaculato cauda utrinque bimaculata squamis magnis*

D 20 + 9, A 5 + 8, P 15, V 1 + 5, C $\begin{smallmatrix} 3 & v & 4 \\ 3 & v & 4 \end{smallmatrix}$ + III M B 5

Fam FISTULARIDÆ

CENTRISCUS GRACILIS *C corpore gracili angusto, elliptico-oblongo supra fusco lateribus argenteis rostro protracto elongato pinnae primæ dorsalis, inter oculos pinnamque caudalem medius spina secunda mediocri, brevior pinnam caudalem nequaquam attingente*

1^{ma} D 4 v 5 2^{da} D 11 A 17, V 1 + 4, P 15, C $\frac{7+IV}{7+V}$

Rarior

In its shape and colour this is very obviously different from the common red Snipefish (*C Scolopax*, L) But I have not been able to assure myself that the above differences are not sexual They are not certainly dependent upon size The depth averages from one-fifth to one-sixth and a half of the whole length, instead of one-fourth of the same In two individuals of the same length within one quarter of an inch, the depth of the larger (*C Scolopax* L) was very nearly double that of the smaller (*C gracilis* nob) and the 2nd spine of the 1st dorsal fin was respectively in each one fourth and one seventh of the whole length of the fish

Fam ESOCIDÆ

BELONÆ GRACILIS nob — *Catula*

Early in March last year (1838) a fisherman brought alive in seawater two fishes which, in their slenderness, and the upper jaw being only half the length of the lower, differed obviously from the common *B vulgaris* Measuring, however seven or eight inches only in length, it seemed questionable, in the absence of equal-sized individuals of *B vulgaris* for comparison, whether they might not be the young of that species My friends, however the Rev L Jenyns and Mr Yarrell, have examined these two individuals, and the latter warrants me in stating, on their joint authority, that these two fishes are "not, in their opinion, *B vulgaris*," being 'much more slender for the same or equal length'

Scomberesox Saurus, Cuv

The Portuguese name 'Delphine' (rectius 'Delfin') is erroneously appended to this fish Another individual has been lately brought to me with the name of 'Almeirão,' but the species is far

too rare to have obtained any permanent and genuine appellation in Madeira

Fam SALMONIDÆ

SCOPELUS MADERENSIS

A small dark mulberry-coloured fish which might easily be taken for the fry or young of *Pomatomus telescopus*, Risso The dark vinous-coloured ground is concealed by very large deciduous platina-like scales The only individual which has yet occurred was three inches long It approaches very near to *Sc Humboldtii*, Risso, Hist III 467 (supposed to be identical with Pennant's *Argentine*, Yar 11 94), and has the row of longer silver dots, or pits extending forwards from the root of the caudal fin along the ventral line but it disagrees remarkably with the generic characters assigned to *Scopelus* by Cuvier, R An 2nd Ed II 314, in having both the palatines and tongue aculeate with teeth

The fin formula in the Madeiran fish was

1st, D 3 + 10, 2nd, D 1 club- or feather-shaped,

A 2 + 12 P 13, V 1 + 7, C $\frac{7 + \overline{I} + \overline{IX}}{6 + \overline{I} + \overline{VIII}}$

Gen ALYSIA

Corpus subelongatum, compressum, dorso postice ventreque spinoso serratis *Rostrium* brevissimum ore rictuque magnis, hoc pone oculos diducto *Dentes* minuti, tenues, in maxilla inferiore Vomeris, et Palatinis scobinati *Lingua* postice lateribus subaculeolata

Squamæ magnæ haud deciduæ, scabræ, squamis lineæ lateralis latissimis, maximis, scutellatis, super totam longitudinem loricato-imbriatis

Pinnæ ventrales sub apice pinnarum pectoralium sitæ *Dorsales* duæ, prima inter Ventrals et Analem posita, 2^{da} ad finem analis, rudimentali *Pinna caudalis* minima, furcata

ALYSIA LORICATA

The spinoso-serrate ventral and hinder part of the dorsal lines, together with the peculiar scales of the lateral line, appear to forbid the blending of this interesting little fish with the Cuvierian genus *Aulopus*, as defined in the R An II, Ed 2 II 315, though they have many characters in common The Maderan fish is no less rare than elegant It scarcely exceeds two inches in length The back is a deep blue, the sides bright silvery or platina, and a row of dead-silver dots or pits extends along the ventral line, as in the *Scopelus* above described The fin-formula is

1st, D 2 + 10, 2nd, D rudimentary, A 2 + 21 (+ 8 detached depressed points or spines), P 15 or 16, V 1 + 5,

$$C \frac{4 + \overline{I} + \overline{IX}}{3 + \overline{I} + \overline{VIII}}$$

Fam GADIDÆ

MACROURUS ATLANTICUS —“*Praga*” or “*Lagartixa do mar*” —

M fusco-cinereus, dorso vinoso, gutturis umbilico pinnisque ventralibus atris squamis areolato scaberrimis, echinulatis, ecarinatis, inermibus oculis maximis

M rupestris, nob in Synops Mad Fish, p 190, nec Bl nec Cuv et omiss syn *Lepidoleprus celorhynchus*, Risso

On further examination, this most singular fish appears to be quite distinct from *M rupestris*, Bl t 177, and therefore, according to Cuvier (R Anim 2nd Ed ii 337 note,) from *Lepidoleprus celorhynchus*, Risso, through which indeed alone I had referred it to the northern fish described by Bloch But besides the points included in the specific character, the first ray of the first dorsal fin is neither serrate nor stronger than the rest The diameter of the eye is one twelfth or one thirteenth part of the whole length which scarcely exceeds one foot

Fam PLEURONECTIDÆ

RHOMBUS CRISIATUS *R corpore oblongo-elliptico oculis approximatis dentibus tenuibus pectinatis, in maxilla superiore uniseriatis, in inferiore anguste scobinatis pinnae dorsalis dimidi anterioris radus apice liberis, primordialibus (2^{do} 6^m) productis, elongatis latere (sinistro) fusco, immaculato squamis (haud deciduis) magnis, margine scabris*

D 92, A 75, V 6, P 1 + 9, C $\frac{3 + \overline{VI}}{3 + \overline{V}}$ Rariss

The Whiff of British authors (*R megastoma*, Yarr 2 251) appears the nearest ally of this apparently new species Indeed, except for Mr Yarrell's more detailed account, I should have scarcely perhaps scrupled referring it to “*La Cardine ou Calimande*” of Cuvier's R Anim 2 341, of which he says, ‘ses premiers rayons sont libres’, of course meaning of the dorsal fin Nothing is, however, discernible of this in either Mr Yarrell's figure or description of “The Whiff”, nor even, if correct, does it express sufficiently the peculiarity of this part in the Maderan fish The only individual which has yet occurred was five and a quarter inches long

Fam CYCLOPTERIDÆ

43 LEPADOGASTER ZEBRINUS —“*Chupa sangue*” *L fusco-nigrescens, lateribus postice strigis obliquis, nuchaque fuscus diver-*

gentibus saturatioribus maculisque binis cæruleis pyriformibus pictis naribus buclatis pinnis dorsalibus analibusque caudali adnatis

D 17 v 16, A 10 v 9, P 15 v 16, V^s 4, C 7 + X Haud rara

In the double nasal cilia and connexion of the caudal with the dorsal and anal fins this little fish agrees with *L. cornubicus* (Flem.) Yarr 2 264 The structure of the sucking disk is also similar to the representation of the same part in that species and not to that of the "*bimaculated Sucker*" at p 268 In this particular it perfectly agrees also with the former species indicated in my Synopsis, p 190 which is, however perfectly distinct specifically, having neither a nasal cilium nor the caudal fin united with the dorsal and anal fins Of this last mentioned species no second example has yet occurred The present (*L. zebrinus*) is not by any means uncommon It varies considerably in intensity of colour, and in the distinctness of the darker stripes upon the nape and flanks The nasal cilia are of the general dark brown or blackish tint

Fam ECHENFIDÆ

SS *Cauda lunata*

Echeneis Remora, L Syst Ed 12 — '*Pegador* *E tota cinereo-fuliginosa, nigrescens lamina disci XVII v XVIII, pinnis pectoralibus brevibus, ovatis, integris, apice rotundatis lingua lævi*

D 23, A 23, P 26, V 1 + 5, C $\frac{3v\ 4 + VIII}{3v\ 4 + VII}$, M B 9 Rarior

ECHENEIS PALLIDA *E tota pallide cinerea, fuligineo hinc et hinc subnebulata lamina XIX, pinnis pectoralibus brevibus latis, apice rotundatis, subtruncatis, tenuiter crenulatis lingua medio scobinata*

D 24, A 22, P 27, V 1 + 5, C $\frac{3v\ 4 + VIII}{3v\ 4 + VII}$, M B 9 Rariss

SS *Cauda integra, S truncata*

ECHENFIS JACOBÆA — *E tota cinereo-fuliginosa, nigrescens lamina XIX pinnis pectoralibus brevibus, latis, pectinato-rotundatis crenatis ventre sulcato lingua scabra*

D 24, A 24, P 21, V 1 + 5, C $\frac{3 + VII}{3 + VIII}$, M B 8 Rariss

ECHENEIS VITTATA — *E purpureo nigrescens, pallido variegata, fasciæque nigra longitudinali laterali, antice utrinque albo marginata pinnis pectoralibus ovatis, acutiusculis integris, pinnae dorsalis analisque antice caudalisque marginibus albis lamina XXIV lingua scabra oculis magnis corpore elongato, postice valde attenuato, gracili*

D 39 A 39, P 22, V 1 + 5, C $\frac{1}{1} + \frac{VIII}{VII}$ •Rariss

The nearest ally of this very distinct species appears to be *E lunata* Bancr in Zool Journ V 413 t 18 But this besides other differences, has a lunate tail

ECHENEIS BRACHYPTERA (Echeneis ——— ? Syn p 191) *E cinereo fuliginosa, nigrescens, pinnis dorsalibus analibusque antice albo submarginatis lamina xvi pinnis pectoralibus brevibus latis truncatis integris lingua medio scobinata*

D 28, A 24, P 26, V 1 + 5, C $\frac{3v}{3v} \frac{4}{4} + \frac{VII}{VII}$ M B 8.

This is the first of the two species indicated by me in the former part of this List or Synopsis Of the second sort there mentioned as having been seen by Miss Young and which I have there doubtfully referred to *E naucrates*, L no fresh example has occurred I should now be much inclined to consider it identical with *E vitata* but Miss Young affirms that it was “ certainly plain-coloured ”

Fam MURÆNIDÆ

Sphagebranchus serpens

S serpa Risso Hist Nat iii 195 No 81

A single individual only has occurred precisely answering to the description above referred to It measured eleven inches in length I could not detect the slightest rudiment of pectoral fins

Fam GYMNODONTIDÆ

LETRONDON CAPISTRATUS *T pusillus oblongiusculus lævissimus dorso utrinque inermibus, nudis, ventre adpresso spinuloso dorso fusco, lateribus ochraceo-fulvis fusco longitudinaliter bifasciatis capiteque utrinque caruleo punctatis, ilius oblique lituratis rostroque subproducto gulave semi-capistrato pinna caudali utrinque nigro-limbata*

D 9, A 8 P 16, C $\frac{2}{2v-3} + VII$ Rariss.

A most elegantly coloured little species, which I cannot refer with certainty to any already described Only two individuals have hitherto occurred The first was little more than two inches long, the second nearly twice as large

The *Orthogoriscus* of Madeira called by the fishermen, “ *Peixe Porco*,’ or “ *Bouto*,’ I forbear at present to designate further not having seen a sufficient number of individuals to determine its characters The caudal fin is produced into a short point in the middle, not truncate, as in all the figures to which I have access of the European Sun fishes

Fam SQUALIDÆ

CARCHARIUS FALCIPINNIS "*Faqueita*" *C* corpore supra griseo-cinereo, subabbreviato, medio crassiore s altiore, utrinque attenuato rostro brevi, lato, depresso, apice obtuso oculis rotundatis pinna dorsali prima alta, triangulari, subantica s supra medium pinnarum pectoralium posita pinnis pectoralibus falcatis, angustis, elongatis, apice obtusis pinna dorsali secunda analique oppositis ventralibusque parvis Rariss

An *Squalus ustus*, Dum ?

It is perhaps only for want of better materials for comparison that I have been unable to refer this Shark precisely to the above indicated or to some other described species. It is about three feet long and the female differs in nothing from the male. The teeth are precisely similar to those of the "*Tintureira*" (*C glaucus*, Cuv.)

The '*Murao*' proves to be, as I suspected, *Lamna cornubica* Cuv., adult, or of large size.

Gen ACANTHIDIUM

Corpus gracile, elongatum *Spiracula* magna *Pinnæ dorsales* duæ antice spiniferæ, secunda major postica, caudæ approximata *Pinna analis* nulla *Pinnæ ventrales* subposticæ s secunda dorsalis subanteriores

Dentes utriusque maxillæ dispares parvi superioris laniani, plano-triangularis, tenues, acuminati, acumine recto, basi utrinque denticulo aucto, antice triseriati, lateribus biseriati inferioris incisorii acumine utrinque a medio oblique deflexo, uni- vel bi seriatu *Cauda* oblique oblonga, apice truncata

This new genus appears exactly intermediate between the established genera of Cuvier, *Spinax* and *Centrina* agreeing with the former in its elongated form and with the latter in the teeth.

The ventral fins are placed more backward than in *Spinax*, but rather forwarder than in *Centrina*, i.e. neither halfway between the two dorsal fins nor opposite the second dorsal fin, but just before the second dorsal fin which begins exactly opposite the termination of their base. The tail or caudal fin resembles that of *Spinax*, rather than of *Centrina*, and the spines of both the dorsal fins are reflexed as in *Spinax*, forming the fore-edge of each fin. The pectoral fins are abruptly truncate. The second dorsal fin is greatly larger than the first, in which it differs equally from *Spinax* and *Centrina*. The teeth are not arranged quincuncially, but behind each other in rows.

Two species have occurred, both of which have hitherto been confounded with *Centrina*.

ACANTHIDIUM PUSILLUM "Gata negra" *A totum atrum, pusillum rostro crassiusculo dentibus inferioribus uniserialis spiraculis oculo remotiusculis*

Centrina? nigra, nob olim in Proceed Zool Soc 1833, p 144*
Syn Mad Fish in Trans Zool Soc p 194 Rariss

Four individuals of this curious little shark have now occurred, agreeing equally in the foregoing characters and in their dimensions, varying in length only from eleven to twelve inches. The second dorsal fin is somewhat forwarder or more distant from the origin of the tail than in the next species.

The condition of the teeth and constancy of size both indicate an adult fish and a comparison of the present species with the foetal and adult state of the following in these two points alone demonstrates *Acanthidium pusillum* to be no stage of *A calceus*.

ACANTHIDIUM CALCEUS "Sapata" *A purpureo fuscum, sub- tus pallidius, rostro plano depresso dentibus inferioribus biserialis spiraculis oculo, pinnaque dorsali secunda cauda approximatis*

Centrina Salviani, Syn Mad Fish in Trans Zool Soc p 191
nec aliorum Rarior

This shark very much resembles in its general aspect *Scymnus nicæensis*, Risso, the "Gata" of Madeira but is at once distinguished by the spines in front of the two dorsal fins which, as in *A pusillum*, are both recurved, and ought, had I attended to the excellent figures copied by Willoughby from Salviana of *Centrina nigra*, Cuv, instead of allowing myself to be deceived by a miserable figure of Lacépède's alone to have preserved me from the blunder of referring to that species for the present shark, the usual size of which exceeds by a few inches only three feet.

Fam RAIIDÆ

Raja oxyrhynchus, Will, Ichth p 71 — "Raja"

Sharp-nosed Ray, Penn, Ed 1 iii 83 No 31 Yarr, Brit Fish vi 424

Two male individuals only have occurred the largest, measuring three feet in width from wing to wing, was furnished on the back with patches of strong hooked spines or prickles, much in the figure in the British Fishes, but the second example, scarcely two

* A serious erratum has been caused here by the transposition of a sentence. The paragraph referred to should stand thus "It (*Centrina nigra*) is intermediate in characters between *Centrina*, Cuv and *Acanthias* Risso, having the teeth of the former genus as well as the backward position of the second dorsal (*rectius* ventral) fin, and the form of body of the latter."

feet wide, although decidedly a male, was devoid of these appendages. The colour of the upper surface was a pale dull, yellowish or ashy-grey, obscurely mottled or dappled with a few scattered distant paler whitish spots.

TRYGON ALTAVELA — '*Andorinha do mar*' *T. corpore rhomboideo, duplo latiore quam longo alis expansis cauda perbrevis*

Pastinaca marina *ὑτέρα πτερυγλατεία* Altavela Neapoli dicta *Columnæ* Will. Hist. 65. Tab. C. 1. f. 3. (Copied from F. Columna) — Rariss.

A single female individual only has occurred, measuring five feet and a half from tip to tip of wings.

LII — *Information respecting Botanical Travellers*

*Extracts from a Journal of the Mission which visited Bootan, in 1837-38, under Captain R. BOILFAU PEMBERION By W. GRIFFITH Esq. Madras Medical Establishment**

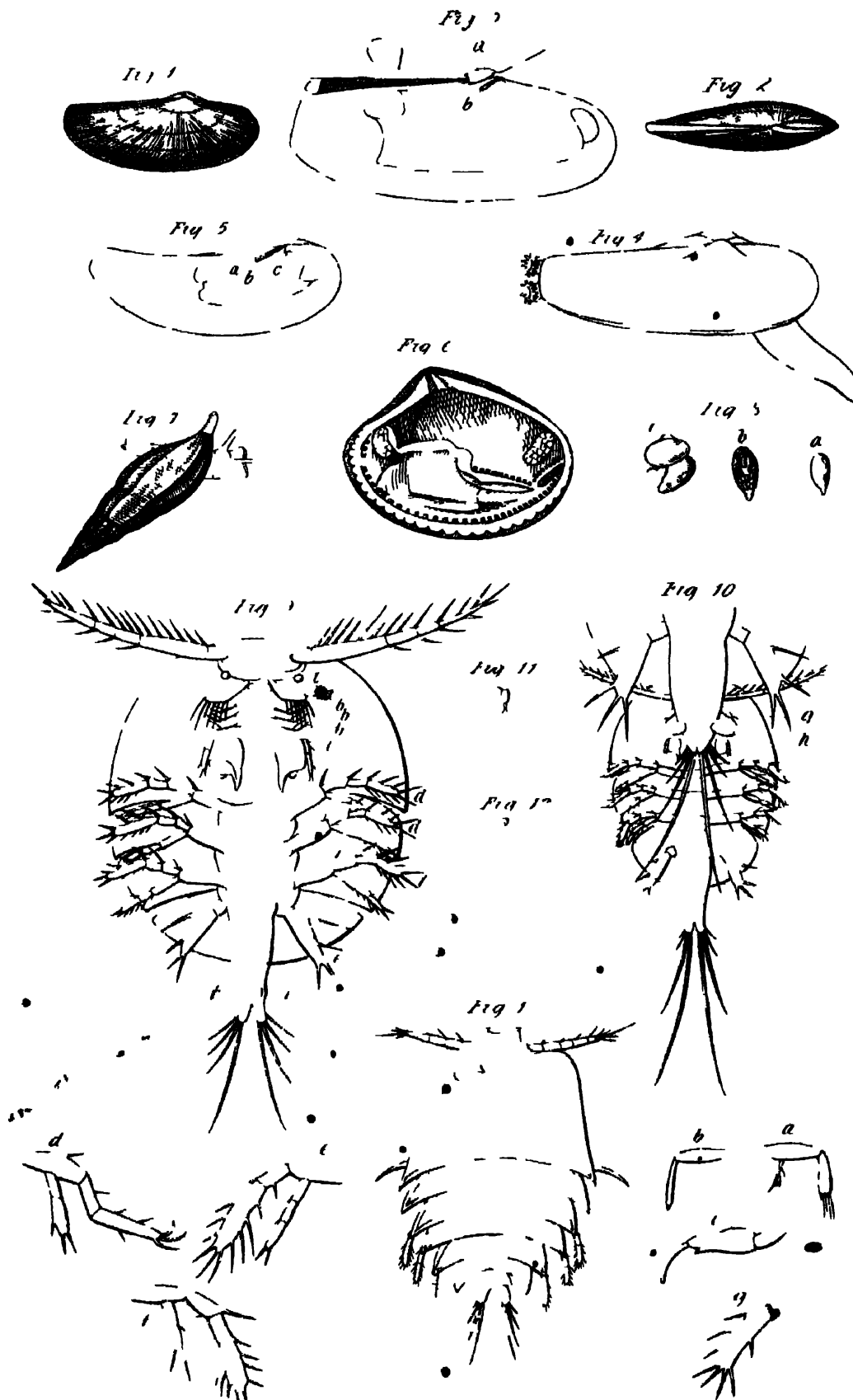
THE MISSION left Gowahatti on the 21st December and proceeded a few miles down the Burrumpootur to Ameengoung where it halted.

On the following day it proceeded to Hayoo, a distance of thirteen miles. The road, for the most part, passed through extensive grassy plains, diversified here and there with low rather barren hills, and varied in many places by cultivation, especially of *sursoo*. One river was forded, and several villages passed.

Hayoo is a picturesque place and one of considerable local note; it boasts of a large establishment of priests with their usual companions, dancing girls, whose qualifications are celebrated throughout all Lower Assam. The village is a large one, and situated close to some low hills. It has the usual Bengal appearance, the houses being surrounded by trees such as betel palms, peepul, banyan, and caoutchouc. To Nulbharee we found the distance to be nearly seventeen miles. The country throughout the first part of the march was uncultivated, and entirely occupied by the usual coarse grasses, the remainder was one sheet of paddy cultivation, interrupted only by tops of bamboos, in which the villagers are entirely concealed, we found these very abundant but small betel palms continued very frequent, and each garden or enclosure was surrounded by a small species of screw pine, well adapted for making fences.

Four or five streams were crossed, of which two were not fordable. Wheels were very abundant, and well stocked with water fowl.

* From the Journal of the Asiatic Society of Bengal, No. 87, p. 208.



and waders At this place there is a small bungalow for the accommodation of the civil officer during his annual visit, it is situated close to a rather broad but shallow river There is likewise a bund road

We proceeded from this place to Dum Dumma which is on the Bootan boundary, and is distant ten miles from Nalbharee We continued through a very open country but generally less cultivated than that about Nalbharee villages continued numerous as far as Dum-Dumma

December 31st We left for Hazareegoung, an Assamese village within the Bootan boundary

We passed through a much less cultivated country the face of which was overrun with coarse grassy vegetation No attempts appeared to be made to keep the paths clean, and the farther we penetrated within the boundary, the more marked were the effects of bad government We crossed a small and rapid stream with a pebbly bed, the first indication of approaching the Hills we had as yet met with

We left on January 2d for Ghoorgoung a small village eight miles from Hazareegoung, similar high plains and grassy tracts almost unvaried by any cultivation, were crossed, a short distance from the village we crossed the Mutanga a river of some size and great violence during the rains but in January reduced to a dry bouldery bed There is no cultivation about Ghoorgoung, which is close to the Hills between which and the village there is a gentle slope covered with fine sward

We entered the Hills on the 3d, and marched to Dewangari, a distance of eight miles On starting we proceeded to the Durunga Nuddee, which makes its exit from the Hills about one mile to the west of Ghoorgoung, and then entered the Hills by ascending its bed, and we continued doing so for some time, until in fact we came to the foot of the steep ascent that led us to Dewangari The road was a good deal obstructed by boulders, but the torrent contains at this season very little water

The mountains forming the sides of the ravine are very steep, in many cases precipitous, but not of any great height They are generally well-wooded, but never to such a degree as occurs on most other portions of the mountainous barriers of Assam At the height of about 1000 feet we passed a choky, occupied by a few Booteas, and this was the only sign of habitation that occurred

Dewangari, the temples of which are visible from the plains of Assam, is situated on a ridge, elevated about 2100 feet above the

level of the sea, and 1950 above that of the plains. The village extends some distance along the ridge, as well as a little way down its northern face. The centre of the ridge is kept as a sort of arena for manly exercises, about this space there occur some picturesque simool trees, and a few fig trees, among which is the banyan.

During our long stay at this place we had many opportunities of forming acquaintance with the Soobah, as well as with the immediately adjoining part of his district. We found this almost uncultivated, and overrun with jungle. No huge paths were seen to point out that there are many villages near Dewangari, in fact the only two which bear marks of frequent communication, are that by which we ascended, and one which runs eastward to a picturesque village about half a mile distant, and which also leads to the plains.

The Soobah we found to be a gentlemanly unassuming man. He received us in a very friendly manner and with some state. The room was decently ornamented, and set off in particular by some well-executed Chinese religious figures, the chief of which we were told represented the Dhurma Rajah whose presence even as a carved block was supposed to give infallibility. We were besides regaled with blasts of music. His house was the most picturesque one that I saw, and had some resemblance, particularly at a distance, to the representations of some Swiss cottages. It was comparatively small but as he was of inferior rank, his house was of inferior size.

The population of the place must be considerable, it was during our stay much increased by the Kampa people, who were assembling here prior to proceeding to Hazoo. Most of the inhabitants are pure Booteas, many of them were fine specimens of human build, certainly the finest I saw in Bootan. They were, strange to say, in all cases civil and obliging. Cattle were tolerably abundant, and principally of that species known in Assam by the name of *Mithans*, they were taken tolerable care of, and picketed in the village at night. Some, and particularly the bulls, were very fine, and very gentle. Ponies and mules were not uncommon, but not of extraordinary merits. Pigs and fowls were abundant. The chief communication with the plains is carried on by their Assamese subjects, who are almost entirely Kucharees. They bring up rice and putrid dried fish, and return with bundles of manjistha.

On the 23rd, after taking a farewell of the Soobah, who gave us the Dhurma's blessing, and as usual decorated us with scarfs, we left for Rydang, the halting house between Dewangari and Khegumpa, and distant eight miles from the former place. We reached it late in the evening, as we did not start until after noon. We first de-

scended to the Deo-Nuddee, which is 800 or 900 feet below the village, and which runs at the bottom of the ravine, of which the Dewangari ridge forms the southern side, and we continued ascending its bed almost entirely throughout the march. The river is of moderate size, scarcely fordable however in the rains, it abounds with the fish known to the Assamese by the name of Bookhar, and which are found throughout the mountain streams of the boundaries of the province.

24th Left for Khegumpa. The march was almost entirely an uninterrupted ascent, at least until we had reached 7000 feet, so that the actual height ascended amounted nearly to 5000 feet. It commenced at first over sparingly wooded grassy hills, until an elevation of about 4000 feet was attained, when the vegetation began to change, rhododendrons, and some other plants of the same natural family making their appearance. Having reached the elevation of 7000 feet by steep and rugged paths, we continued along ridges well clothed with trees, literally covered with pendulous mosses and lichens, the whole vegetation being extra-tropical. At one time we wound round a huge eminence the bluff and bare head of which towered several hundred feet above us by a narrow rocky path or ledge overhanging deep precipices, and thence we proceeded nearly at the same level along beautiful paths through fine oak woods, until we reached Khegumpa, the distance to which although only eleven miles took us the whole day to perform.

This march was a beautiful, as well as an interesting one, owing to the changes that occurred in the vegetation. It was likewise so varied that although at a most unfavourable season of the year I gathered no fewer than 120 species in flower or fruit. Rhododendrons of other species than that previously mentioned oaks, chesnuts, maples, violets primroses, &c &c occurred. We did not pass any villages, nor did we meet with any signs of habitation, excepting a few pilgrims proceeding to Hazoo.

Khegumpa itself is a small village on an exposed site, it does not contain more than twelve houses and the only large one, which as usual belonged to a Sam Gboroo appeared to be in a ruinous state. The elevation is nearly 7000 feet. The whole place bore a wintry aspect the vegetation being entirely northern and almost all the trees having lost their leaves. The cold was considerable, although the thermometer did not fall below 46°. The scarlet tree rhododendron was common, and the first fir tree occurred in the form of a solitary specimen of *Pinus excelsa*. In the small gardens attached to some of the houses I remarked vestiges of the cultivation of tobacco.

and Probosa* In the valleys however surrounding this place there seemed to be a good deal of cultivation, of what nature distance prevented me from ascertaining

25th Left for Sasee We commenced by descending gradually until we had passed through a forest of oaks, resembling much our well-known English oak, then the descent became steep and continued so for some time we then commenced winding round spurs clothed with humid and sub tropical vegetation, continuing at the same elevation we subsequently came on dry open ridges, covered with rhododendrons The descent recommenced on our reaching a small temple, about which the long-leaved fir was plentiful and continued without interruption until we reached a small torrent Crossing this we again ascended slightly to descend to the Dimree river, one of considerable size, but fordable The ascent recommenced immediately, and continued uninterruptedly at first through tropical vegetation, then through open rhododendron and fir woods, until we came close upon Sasee, to which place we descended very slightly This march occupied us the whole day After leaving the neighbourhood of Khegumpa we saw no signs of cultivation, the country, except in some places was arid, coarse grasses, long-leaved firs, and rhododendrons forming the predominating vegetation We halted at Sasee, which is a ruined village, until the 28th The little cultivation that exists about it is of barley, buckwheat, and hemp

28th We commenced our march by descending steeply and uninterruptedly to the bed of the Geeri, a small torrent, along which we found the vegetation to be tropical, ascending thence about 5000 feet we descended again to the torrent, up the bed of which we proceeded for perhaps a mile, the ascent then again commenced and continued until we reached Bulphai The path was generally narrow, running over the flank of a mountain whose surface was much decomposed, it was of such a nature that a slip of any sort would in many places have precipitated one several hundred feet The face of the country was very barren, the trees consisting chiefly of firs and rhododendrons both generally in a stunted state The vegetation was not interesting until we came on a level with Bulphai, when we came on oaks and some other very northern plants We were well accommodated in this village, which is a very small one, situated in a somewhat sheltered place, and elevated to 6800 feet above the sea The surrounding mountains are very barren on their southern faces, while on the northern, or sheltered side very fine

* *Eleusine coracana*

oak woods occur. The houses were of a better order than those at Sasee, and altogether superior to those of Khegumpa. They are covered in with split bamboos, which are secured by rattans, a precaution rendered necessary by the great violence of the winds, which at this season blow from the south or south-east. Bulphai is a bitterly cold place in the winter, and there is scarcely any mode of escaping from its searching winds. The vegetation is altogether northern, the woods consisting principally of a picturesque oak, scarcely ever found under an elevation of 6000 feet. There is one small patch of cultivation thinly occupied by abortive turnips or radishes, and miserable barley. It was at this place that we first heard the very peculiar crow of true Bootan cocks, most of which are afflicted with enormous corns.

On the 31st we resumed our journey, ascending at first a ridge to the N E of Bulphai, until we reached a pagoda, the elevation of which proved to be nearly 8000 feet, and still above this rose to the height of about 10 000 feet a bold rounded summit, covered with brown and low grass. Skirting this at about the same level as the pagoda, we came on open downs on which small dells, tenanted by well defined oak woods were scattered. After crossing these downs, which were of inconsiderable extent, we began to descend and continued doing so until we came to Roongdoong. About a third of the way down we passed a village containing about twenty houses with the usual appendage of Sam Gooroo's residence and still lower we came upon a picturesque temple, over which a beautiful weeping cypress hung its branches. We likewise passed below this a large temple raised on a square terrace basement. From this the descent is very steep, until a small stream is reached, from which we ascended very slightly to the castle of Roongdoong in the loftiest part of which we took up our quarters. From the time that we descended after crossing the downs the country had rather an improved aspect, some cultivation being visible here and there. We met a good many Kampas pilgrims and one chowry tailed cow, laden with rock salt, which appears to be the most frequent burden.

[To be continued.]

Mr Schomburgk's recent Expedition in Guiana

[Continued from p 328.]

WHEN marching early in a morning over the savannahs, and on approaching an Indian settlement, we frequently observed on the small sandy footpath a number of marks, which a hasty observer would

have pronounced to be the prints of dogs' feet. The Indian is better acquainted with them, they are a sure proof that a pack of Carasissis paid the preceding night a visit to the hen-roost at the next Molocca or Indian village, and on entering it, the long faces of the squaws, and their vociferous gesticulations, spoke volumes of the depredations which these night robbers had committed among the feathered stock.

The Carasissis or Savannah dog, as it is called by the colonists, is the only animal allied to the dogs found in Guiana. It does not attain the size of the fox, but is of a stronger make than that animal, and has a shorter tail and more obtuse muzzle. In the form of the head and position of the eyes, it approaches more nearly to the dogs and, in fact, appears to be intermediate between them and the foxes and while these refuse to mix together, the Carasissis is much sought after by the Indians to make a cross breed with their dogs. There are few of these animals in the neighbourhood of the sea coast or in the cultivated part of Guiana, but on the savannahs they are found hunting in large packs. They pursue their prey principally by the eye but in thick woods they follow it by the scent. During our expedition up the river Berbice, some of our hunters met with a pack of Carasissis, and they succeeded in securing one alive, but not having tied it sufficiently it gnawed its ropes and escaped. While we sojourned in Pirari, one was shot in the act of committing depredations among the poultry. It measured 2 feet 2 inches from the snout to the insertion of the tail, the latter being $10\frac{3}{4}$ inches in length. The breast and belly were of a dusky white, the other parts of a deep buff colour, with the exception of the muzzle and the ears, which were dark, approaching almost to black. The tail was not so bushy as that of the fox nor was it so long. They carry their ears erect.

They vie in cunning and art with the European fox, and the depredations which they commit on the hen-roosts are considerable. Their favourite haunts are thickets near open savannahs, and if a pack succeed in entering the village and in surprising the Indians poultry, few escape, as they completely surround the roosting-place, and generally carry off their spoil before the inhabitants have any idea of their presence. I have been assured by the Indians that they soon run down deer, and pursue their game under full cry. They destroy in other ways large quantities of game.

I bought in the commencement of November a young one, which I considered about three weeks old. Its fur was darker than that of the adult, we fed it on boiled yams, ripe plantains, meat, and fish.

It appeared chiefly fond of plantains and would follow those who fed and nursed it like a dog. When incensed it growled like a puppy, but when in pain or tired of walking it would raise its voice to a harsh grating tone. They seldom lose, even when domesticated, their predatory habits and those Indians who raise them for the sake of procuring a cross breed with the dog are obliged to keep them tied, as otherwise they would kill all the fowls and parrots*. It is called by the Macusis MAIKANG in Warrau WARITYOU.

The variety which has sprung from the breed between the Indian domestic dog and the CARISSI more resembles the dog, its body is however longer in proportion to its size and its ears are pricked up. Their progeny become prolific. They are hardy and many of them prove excellent hunters they are therefore very much prized by the Indians who pay great attention to their training †.

These extensive savannahs are likewise the favourite haunt of the Brown Coat (*Nasua fusca*) of the colonists or Quasy and Kibihî of the natives of Guiana. They measure about 18 inches and the tail which is nearly the same length is always carried erect. It is brown brightening to a rust colour on the belly and breast, the tail brown with rings of black, the snout long and movable, the canine teeth strong and hooked, legs short, the hind a little longer than the fore ones, the feet long it walks always upon its heels like the bears, frequently standing upon its hind legs.

They live in large societies, and know how to defend themselves bravely if attacked by dogs, indeed they fall often *en masse* upon them and kill the assailants. They are excellent climbers, and in

* The Carassî is Desmarest's *Canis cancrivorus*, of which he gives the following description, communicated to me since writing the above by Mr Waterhouse.

Canis cancrivorus, Desmarest

“ Pelage cendré et varié de noir en dessus, parties inférieures d'un blanc-jaunâtre, oreilles brunes, côtes du cou derrière les oreilles, fauves, tarsi et bout de la queue noirs .

	Pieds	Pouces
Longueur du corps	2	4
Longueur de la queue	0	11

Il fut sa proie des Agoutis et des Paca, &c. et il mange aussi des fruits, tels que ceux du bois rouge. Il va par petites troupes de dix ou sept individus. Patrie La Guyane Française.

† A good dog of that description which is trained to hunt deer, tapir, wild hogs, paca or labr, &c. generally fetches a price of from ten to twelve pounds sterling the dogs imported from Europe suffer much from the effects of the climate, and some kinds, as greyhounds, foxhounds, spaniels, pointers, cockerels, &c. seldom thrive. Terriers and bull dogs appear to accustom themselves earlier to the climate.

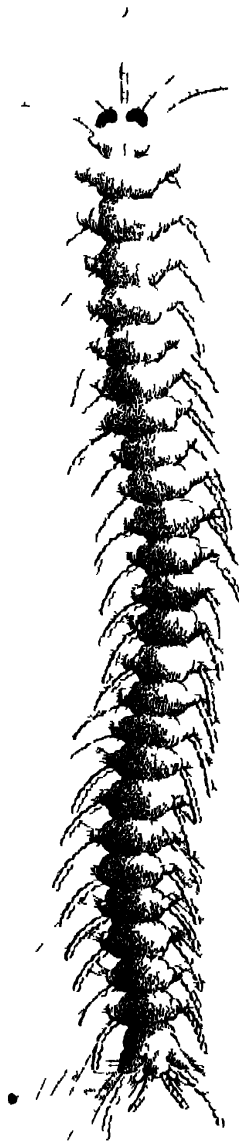
descending a tree they always come down head foremost Their food consists of insects, fruits, roots and such small prey as they are able to secure They are destructive to young birds, and expert in digging after large beetles, for which their claws, which are very strong, are admirably adapted They do not burrow in the ground for a residence

A friend of mine in Barbice possessed a brown Coati which was domesticated In its disposition it was extremely mild, and very fond of being caressed, it was sometimes induced to play, although it evidently preferred passing the greater part of the day asleep, rolling itself up in a lump When receiving its food it sat apparently with great ease on its hinder legs, and thrusting its nails into the food, it carried it in this position with both its paws to the mouth It possessed the peculiarity of gnawing on its own tail, which organ bore the marks of this strange propensity Its smell was strong and disagreeable, and would have deterred many from keeping such an animal in their house

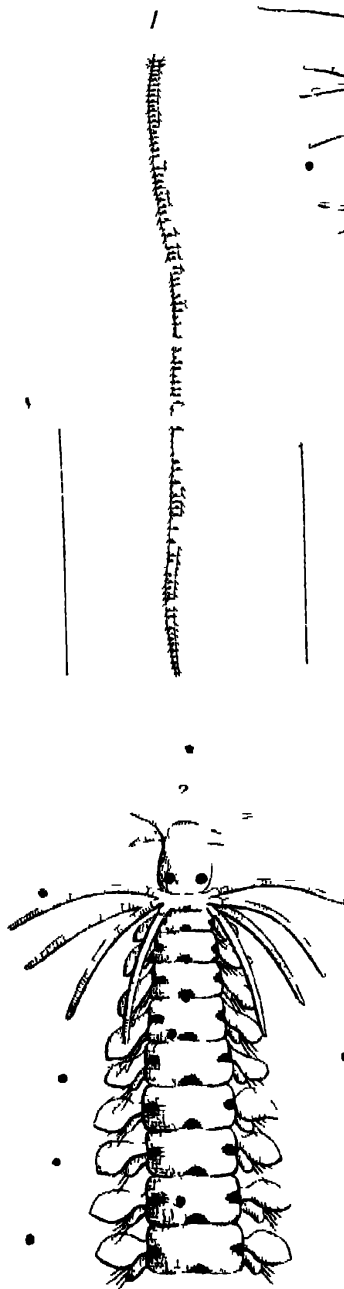
Although it seemed generally to derive great pleasure from being stroked down the back when it received these caresses from its master it would turn over, and return with its paws these caresses or thrust its long muzzle under the sleeve, uttering at the same time a soft and gentle cry If a cat or a dog approached it, the soft cry would change to a shrill sound

While travelling over the savannahs we have frequently met them at broad daylight, and I recollect once a chase ensued that was highly characteristic The instant poor Quasy perceived itself pursued it made for the high grass, where no doubt it would have been able to hide itself, if its tail, which it carried erect, did not point out its situation We found the single dog in our company unable to contend with it, the Indians assisted therefore to dislodge it from the retreat which the high grass partially afforded The Coati now made for the open savannah, the Indians following the harassed animal shouting, the dog barking it chose a path embarrassed with thorns and briars, and took to the swampy ground below the stately Mauritius palms, but this was of no avail, its pursuers not being deterred, like a hare it doubled back to the spot grown over with high grass, where it vainly sought for protection Its strength being exhausted, it was soon seized by its long tail by one of the Indians, but even here it defended itself with desperate obstinacy, the Indian was obliged to loose his hold, and a new scuffle arose wherever it turned it met an enemy, beaten with bows and long poles, fired at with ar-

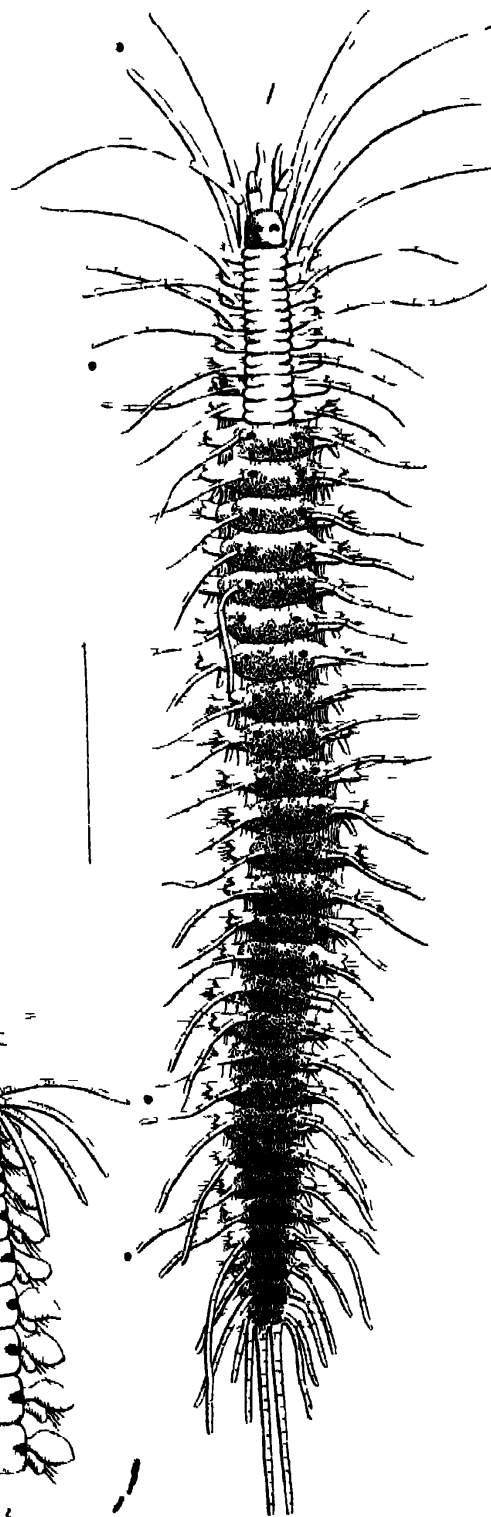
rows,



Lorda



British Nereides



Psamathu

rows worried by the dog it at last expired but I have seldom seen such tenacity of life evinced as in this small animal

Naturalists differ whether *Nasua fusca* and *rufa* are distinct in species or mere variations in colour I must confess that I have seen every variety of shade in the brown species and a change in the colour of the fur takes place at the setting in of the rainy season in May, when they are generally darker Nevertheless the Indians have told me of a black species which they say is to be found in the land of the Waccawai Indians who inhabit the banks of the Maraurung I have never had the fortune to meet with it however I possess the following note from Mr Vieth who is already observed accompanied me during my late expeditions —

‘ I have seen only one specimen which was brought by Macusis who came from the Essequibo by land over to the Demerara river It was a size larger than the largest brown coat I have seen, and of a shining black with the exception of the tail which was ringed with white In its habits and proportions it resembled exactly the brown coat ’

The geographical range of the *Nasua fusca* extends over Guiana and is to be met with as well at the coast regions as at the plains of the interior and since we know that it inhabits Brazil likewise its distribution appears of great extent

Although the Racoon is not an animal which inhabits the savannahs*, its relation to the preceding genus induces me to give now the few particulars which I know about its habits It frequents the sea coast and is generally found in the neighbourhood of inhabited spots where it is destructive to poultry It is about 2 feet long and 9 inches high, the head is large snout full and thick, the ears of a moderate length, the nose is rather short and more pointed than that of a fox indeed its head reminds me of that of the hyæna The fore feet are shorter than the hinder the five claws sharp strong and with them and its teeth, which resemble those of a dog, it makes a vigorous resistance or attacks its prey with success Its hair is long and shaggy but very short upon the legs from the knee downwards the colour of its fur is a light brown the legs black the tail thick, tapering towards a point and marked with black rings

Among the favourite haunts of these animals are the thickets of Curida bushes (*Avicennia tomentosa*) which extend along the sea coast, where they feed upon crabs which they are expert in killing

* It appears entirely local to the sea coast, the Macusi Indians do not know the animal The Warrans from the Coréntyne call it Oghia

first tearing off their claws or nippers and being thus disabled from doing harm, the crab dog or racoon uses its sharp teeth to break the shell. In their native state they sleep by day, and issue at dusk in search of food, birds, insects, roots, and vegetables, nothing comes amiss and as they possess a particular fondness for sweets, I have been told by practical planters that the injury which they do to sugar plantations is very considerable.

They take their food with both paws like the squirrel, and are fond of dipping it in water. I have noted with astonishment that they drink as well by lapping like the dog as by sucking. I have had several in a domesticated state all of which possessed this peculiarity.

They are very active, their sharp claws enable them to climb trees with great agility, and to leap with security from branch to branch. When on the ground they move forward by bounding and in an oblique direction, nevertheless they are swift enough, and rarely fall a prey to their pursuers.

They are easily domesticated when taken young, and are then harmless and amusing but our endeavours to accustom two adults which we had secured to a domesticated state proved entirely vain. We were obliged to keep them chained, they refused apparently to eat or drink, and died the first two weeks after we had entrapped them.

I have been told of a second species but neither Mr Vieth nor myself have ever met with it, nor have I been able to ascertain in what its distinguishing characters consist.

[To be continued]

BIBLIOGRAPHICAL NOTICES

Etudes de Micromammalogie. Revue des Musaraignes, des Rats et des Campagnols suivie d'un Index méthodique des Mammifères d'Europe
Par Edm. De Selys-Longchamps. Membre de plusieurs Sociétés savantes. Paris, 1839. 8vo pp 165 pls 3.

We deem it very desirable that this little work should be brought under the notice of our readers as well on account of its intrinsic merits, as on that of its relating to certain groups which have recently attracted much attention in this country. It is also one of that class of books written exclusively for the benefit of the *working* naturalists, which of all others, in our opinion, tend most to the ad-

vancement of zoology Its author is already known to the public by a small brochure published a few years back on the *Arvicolæ* of the neighbourhood of Liège* In the work now under review, he has revised and described all the known species belonging to the three genera of *Sorex*, *Mus*, and *Arvicola* inhabiting Europe, and he has taken great pains in the investigation of their synonyms and in the endeavour to fix their respective characters with certainty and precision, besides giving ample notices of all that had been observed respecting their habits and places of abode As these genera belong to, or almost form in themselves, three distinct families of *Mammalia*, and two out of the three belong even to different orders, it is clear that they could not be collected into one group established upon their mutual affinities and offering any characters by which they might be distinguished in common from the rest of the class It is this circumstance which has led M. De Selys Longchamps to adopt as a title to his work the term *Études de Micromammalogie*, indicating simply the study of the *Cheiroptera*, *Insectivora* and *Rodentia*, or the three orders of *Mammalia* embracing the smallest species in the class and none of which exceed a moderate size and he disclaims all idea of attaching any further importance to this term or of wishing it to be accepted rigorously, as implying a distinct branch of Mammalogy With regard to the particular genera selected for illustration in this work it is observed that they are those least understood and most numerous in species and that the greater part of the other *Rodentia* may be found in the works of Pallas, Desmarest, Fred. Cuvier, and De Blainville We much regret however, that the *Cheiroptera* are not included owing it is alleged to the author's not having been able to see himself all the described species, which he considers indispensable to enable him to proceed with his task surely The reason is a good one, and it may serve to impress us with a sense of the caution which he has used in endeavouring to elucidate those groups, monographs of which are now submitted to the public

That he might profit from what has been accomplished by others on the same subject, M. De Selys-Longchamps has visited a large number of museums in France, Italy, Switzerland, and Germany He has also been in correspondence with all the principal naturalists whose names have been associated with any of the groups here treated of With many of them he has effected an interchange of specimens, and by these means he has been enabled to identify such

* *Essai Monographique sur les Campagnols des Environs de Liège* Liège, 1836 8vo, pp 15 4 planches coloriées

species as had been described from time to time, to compare them with each other, and to determine which were to be considered as *true* species, and which as varieties

In the arrangement of the *Soricida* which form the first division of his work M. De Selys-Longchamps has for the most part followed Wagler having only altered the value of the groups established by that author. Thus he considers the entire family as divisible into the two genera of *Sorex* and *Crocidura*. In the former he includes *Sorex* and *Crossopus* of Wagler here considered only as subgenera from their having many characters in common in the ears, in the colouring of the teeth and in the fur and tail and from the number of the small lateral incisors not being esteemed a sufficient ground to warrant a generic separation. The genus *Crocidura* comprises the two subgenera of *Pachyura* and *Crocidura* the former of which is established here for the first time for the reception of the *Sorex Etrusca* of Savi together with these foreign species having one more lateral incisor above than the true *Crocidura* as restricted by our author. It may be useful to those naturalists who are more familiar with Duvernoy's arrangement of this family than Wagler's to state that the subgenus *Sorex* of this work answers to *Amphisorex* of Duvernoy's last memoir *Crossopus* to *Hydrosorex* of the same author and *Crocidura* to *Sorex*, the characters of which it is not necessary to repeat here, as they have been already brought under the notice of the English reader in a former number of this Magazine*. The relative value, however of these groups will be made more clear when exhibited in the following manner and it may be desirable to annex to each the included species

Gen 1 SOREX LIN

Subgen 1 SOREX, Wagl	Subgen 2 CROSSOPUS Wagl
Sp 1 <i>tetragonurus</i> Herm	Sp 4 <i>fodiens</i> Pall
2 <i>pygmaeus</i> Laxm	5 <i>ciliatus</i> , Sow
3 <i>alpinus</i> Schinz	

Gen 2 CROCIDURA WAGL

Subgen 1 PACHYURA De Selys	Subgen 2 CROCIDURA Wagl
Sp 1 <i>Etrusca</i> , Bonap (<i>Sorex Etr</i> Savi)	Sp 2 <i>Aranca</i> De Selys (<i>Sor Aran</i> Auct)
	3 <i>Leucodon</i> Wagl

* Ann of Nat Hist vol 1 pp 422 and 424

The species here indicated are nearly identical with those adopted by Nathusius*, and it is satisfactory to find two authors, who appear to have bestowed equal pains upon the subject, agree in their estimation of what are to be considered good species in a group which almost as much as any that can be mentioned abounds in spurious ones. M. De Selys Longchamps has announced the fact that there are more than eighteen names to choose out of for the common water shrew, and Nathusius has annexed nearly two-thirds that number of synonyms to the *S. tetragonurus*†. The only respects in which the list of species in this work differs from that of Nathusius are the adoption of the *S. alpinus* of Schinz which Nathusius does not appear to have personally examined and the *S. ciliatus* of Sowerby. With regard to this last however it is justly observed that there are many specimens apparently so intermediate between it and *S. fodinus* that the two may yet prove to be varieties of one species as Nathusius seems to have considered them.

As for the species described for the first time by Mr. Jenyns in former numbers of this Magazine M. De Selys-Longchamps not having seen them before the publication of his work, has placed them in an Appendix in which he has presented in a tabular form the distinguishing characters of *S. tetragonurus*, *S. rusticus* and *S. castaneus*, as Mr. Jenyns has stated them. At the same time he observes that those of the *S. rusticus* appear very marked and apply well to a small shrew found by himself in one instance in the province of Liège and which he had previously considered as a young *S. tetragonurus*. He has made a similar observation with respect to the *S. labiosus* of Jenyns the characters of which he briefly notices adding that it agrees well with an individual seen by him at Francfort on Main obtained by Dr. Cretschmar though without an opportunity of inspecting recent individuals he does not venture to introduce it as an authentic species. Since the publication of his book, M. De Selys Longchamps has visited this country, when Mr. Jenyns's species were submitted to his examination. He still declined offering any decided opinion about the *S. labiosus* and the *S. castaneus* but he expressed himself quite satisfied that the small shrew found in Ireland, considered by Mr. Jenyns as a variety of his *S. rusticus* was perfectly distinct from the *S. tetragonurus*†.

* Wiegmann's *Archiv für Naturgeschichte*, 1838, p. 43.

† The name of *Hibernicus* will hardly be appropriate for this species, as it has been found in several parts of England also, but if it be proved, as Mr. Jenyns suspects will eventually be the case, to be not specifically distinct from the shrew which he originally called *rusticus*, it may be retained under this last name, without having recourse to any new one. Mr. Jenyns will, before long, probably offer some remarks on this point.

The second portion of M De Selys-Longchamps' work treats of the European species of *Mus*, L., which are all retained under one genus, admitting however, of two sectional divisions as follows

I *Omnivorous*, ears oblong naked containing six species, viz *M decumanus*, Pall., *M Alexandrinus*, Geoff., *M Rattus*, Lin., *M Musculus*, Lin., *M Islandicus*, Thienem., *M sylvaticus*, Lin.

II *Granivorous*, ears rounded hairy containing two species, viz *M agrarius* Pall. and *M minutus*, Pall. The former of these is stated to be at the limits of the two groups having the general form of *M sylvaticus*, with the ears of the second group

To the above, another section is prefixed, containing what he terms *Rats echimoides*, or those species the fur of which is mixed up with sharp prickly hairs, as in the genus *Echymys*. This group, however is entirely exotic inhabiting the intertropical countries of Asia and Africa

It is not pretended that these divisions are capable of such strict definition as to be applied rigorously, but it is thought that they are sufficiently natural, taking them in the whole without going into details

With regard to the species of this genus the author observes, that they have been much less confused than those of *Arvicola* and *Sorex*, if exception be made of the *M minutus* (the Harvest Mouse of English authors) the synonymy of which we think he has sufficiently cleared up. As for the others it is principally in relation to their habitats and their diagnostic characters that he has found any occasion for making new remarks. The *M Alexandrinus* first described by Geoffroy St Hilaire in the great work on Egypt, is here considered to be the same as the *M Tectorum* of Savi and the Prince of Musignano, although regarded as distinct by the two authors just mentioned. M De Selys-Longchamps has pointed out the insufficiency of those characters which have been resorted to as grounds for separating them. The *M Hibernicus* of Thompson, he has noticed in an appendix along with two Sicilian species discovered and described by Rafinesque, the *M frugivorus* and the *M Dichrurus*, concerning none of which he offers any opinion, as they have not fallen under his own observation. At the same time, in reference to the first, he states, that if the colour of the fur is constant, and especially if the difference in the length of the ears between it and the *M Rattus* is not caused by the way in which the animal is prepared, he should be tempted to admit it as a species. In another place he suggests, whether it may not be a hybrid between the *M Rattus* and the *M decumanus*. He adds, however, that this is not likely

The genus *Arvicola*, which forms the subject of the third mono-

graph in this work, is a more extensive group than either of the two already treated of. It consists of eleven European species, of which no less than four appear to have been first discovered or described by M. De Selys-Longchamps himself. They are all arranged under two sections, each of which is further divided into two others.

I. The first section consists of those species which have the *external ears shorter than the fur, often almost none at all, eyes very small*.

This section comprises the two subordinate groups of (1) *Campagnols aquatiques* (HEMIOTOMYS De Selys,) including *A. amphibius* Lacep., *A. monticola*, De Selys, *A. destructor* Sav. and *A. terrestris*, Sav. and (2) *Campagnols Lemmings* (MICROTUS, De Selys) including the *A. fulvus* of Desmarest, and the *A. Savii* of De Selys.

II. The second section consists of those species which have the *external ears as long as the fur and well developed, eyes varying, often prominent*.

This section is subdivided into the two groups of (1) *Campagnols proprement dits* (ARVICOLA,) including the *A. subterraneus*, De Selys, *A. arvalis* Lacep., *A. socialis*, Desm., *A. duodecim-costatus*, De Selys and (2) *Campagnols murins* (MYOMYS De Selys) which last group is instituted for the reception of the *A. rubidus*, De Selys (the *A. riparia* of Yarrell) which is stated, on the authority of Nathusius, to have the molar teeth with fangs in the adult state, a character wherein it differs from all the other species of the genus.

M. De Selys-Longchamps states that the genus *Mynomes* of Rafinesque forms a third section characterized by its scaly tail. It is not his intention, however, to raise any of these sections to the rank of a genus or a subgenus. He observes that they all pass into each other by insensible differences in the length of the tail and ears, and in regard to the character derived from the fangs of the teeth that it probably exists more or less in other species. And in imposing Latin names on these groups, taken from among the synonyms of the genus, his only object has been to give foreigners an idea of the different names which he has used in French.

It has been already stated that four of the above species were first discovered or described by M. De Selys-Longchamps himself. These are the *A. monticola*, the *A. Savii*, the *A. subterraneus*, and the *A. duodecim costatus*, and it may be useful to repeat here their respective characters, as they are probably not much known to the naturalists of this country, although three of these species have already appeared in the 'Revue Zoologique,' and the fourth has been de-

scribed as well as figured in the author's brochure on the *Arvicolæ* of Liège. They are as follows.

1 *A. monticola*. Size of the *A. amphibius*. Tail pale ash, a little shorter than half the length of the body. Fur yellowish grey, mixt with pale yellowish at the sides, whitish ash beneath and on the feet. (13 pairs of ribs?)

Inhabits the Pyrenees.

2 *A. S. 11*. Size of the *A. arvalis*. External ears a little hairy, much shorter than the fur. Tail a little shorter than one third of the body. Of two colours, brownish above, whitish beneath. Fur brown-grey above, ash colour beneath. Feet pale ash. (14 pairs of ribs.)

Inhabits Tuscan, Lombardy, and probably all Italy.

3 *A. subterraneus*. Size a little larger than that of the *A. arvalis*. Ears a little shorter, of the length of the fur, nearly naked, eyes very small. Tail one third the length of the body. Of two colours, blackish above, white beneath. Fur bluish grey above, ash colour or whitish on the abdomen only. Feet deep ash. (13 pairs of ribs.)

Inhabits Belgium, French Flanders, and the environs of Paris, but no other parts of Europe, unless it be the *Mus agrestis* of Linnæ, in which case it is found also in Sweden.

4 *A. duodecim costatus*. Size of the *A. arvalis*. Tail a little longer than one third of the body. Twelve pairs of ribs, six lumbar vertebra. Fur?

Inhabits the South of France and the frontiers of Switzerland, but supposed to be very rare. No skin of it exists, and only the osteology of it is known. The 12 pairs of ribs distinguish it from every other species excepting the *A. socialis*, and from this it may be known by its longer tail, and by having 6 instead of 5 lumbar vertebrae.

The *A. destructor* is a species found in Italy, which appears to have been recognised by M. De Selys-Longchamps and M. Savi nearly about the same time. It was originally described by the former in the 'Revue Zoologique' under the name of *A. Musignani*, but this name is exchanged here for *destructor* out of courtesy to M. Savi, who had previously thus designated it. It is closely allied to the *A. amphibius* from which it may be known by a difference in the fur, which much resembles that of the *Mus decumanus*, and by the nearly uniform whitish-ash colour of the under parts. But its great peculiarity resides in the form of the cranium, which is said to be quite different from that of its congeners. This part is represented,

* This species was first characterized by M. Baillon in 1834, under the name of *Lemmus pratensis*, but it had been discovered by M. De Selys Longchamps as long previously as 1831.

along with the crania of several other species of *Arvicolæ* in three plates which accompany the present work

The *A. terrestris* is the *A. argentoratensis* of Desmarest and Lesson. It is not the *A. terrestris* of the Fauna Italica, this last being the same as the *A. destructor* mentioned above.

To each of the three monographs in this work is annexed a tabular arrangement of the dimensions of all the species contained in the respective genera. And in the case of the *Arvicolæ* there are added two other tables, one exhibiting the relative characters of the crania in the different species, the other the number of the ribs and vertebræ.

The work concludes with a complete list of all the *Mammalia* hitherto discovered in Europe amounting to 188 species, exclusively of those which have been introduced by man, and which are only domesticated.

We have dwelt the longer on this work in the hope that it may stimulate naturalists to making further researches in our own country. Notwithstanding the labours of M. De Selys-Longchamps, and the pains which he has taken in the monographs above noticed, we are satisfied that the subject is not yet exhausted. There are several species in the three genera of *Sorex*, *Mus*, and *Arvicola* which require further investigation, and doubtless some which remain yet to be discovered. The British *Shrews* are not entirely cleared up. We have also more than once had submitted to our examination specimens of a mouse from the tops of the Irish mountains, closely allied to the *M. sylvaticus*, but apparently offering some differences, unfortunately they were not in a sufficiently good state of preservation to allow of any decided opinion respecting them. We may further add that it appears doubtful whether we have not in our museums two species of *Arvicola* confounded under the name of *A. agrestis* or *arvalis*, one of which is the true *A. arvalis* of M. De Selys-Longchamps, but the other so far distinct as not to have been immediately recognised by this naturalist when specimens were submitted to his view during his recent visit to this country. Ireland again seems to possess a species of this genus which it is likely will be found different from all those hitherto recorded as natives of Great Britain. But further remarks on some of these points will probably be brought under the notice of our readers before long.

PROCEEDINGS OF LEARNED SOCIETIES

ZOOLOGICAL SOCIETY

February 26, 1839 — The Rev F W Hope, in the Chair

Mr Fraser exhibited a new species of *Corythaix* which he proceeded to characterize as follows

CORYTHAIX MACRORHYNCHUS *Cor* rostro prægrandi amantissimo, ad basin sanguineo, capite, crista, collo pectoreque viridibus, crista ad apicem alba, et purpureo notata, linea alba infra oculos excurrente, dorso alisque metallice purpureis, primarius sanguineis nigro marginatis, caudâ superne metallice viridi, femoribus caudâque subtus nigris, tarsis nigris

Long tot 14 poll rostrum, $1\frac{1}{4}$, alæ, 6, caudæ, 6, tarsi, $1\frac{1}{4}$

Hab — ?

This species of *Corythaix* lived for some time in the Society's Menagerie, having been purchased from a dealer who was unacquainted with its locality

Compared with the known species of the genus it approaches most nearly to the *Corythaix Persa* of authors, but from this it may readily be distinguished by its smaller size, and the form comparatively large size and colouring of the beak. The colouring of the plumage also differs in some respects like *C Persa*, the head neck and breast are green but the feathers on these parts are of a deeper hue than in that species, the feathers of the crest instead of being simply tipped with white, having a white transverse line near the apex but at the apex they are purple black. Minute black feathers encircle the eye and a white stripe extends from beneath the eye on to the ear. The beak is much arched above, and somewhat inflated at the base, the nostrils are very large and not hidden, as in *C Persa*, by the decumbent feathers, these extending only to the posterior angle of the nostril. The upper mandible is of a bright yellow colour excepting all that portion which lies below and behind the nostrils, which is of a brilliant red colour, the lower mandible is of the same red tint, but tipped with yellow. Both mandibles present simple sharp cutting edges, in this respect exhibiting a different structure from that observable in the allied species, *C Persa* and *C Buffoni*, in which the mandibles have their cutting edges serrated. The back and upper surface of the wings are of a deep purple blue tint, exhibiting in certain parts greenish reflections. The primaries (with the exception of the first quill) and the secondaries (with the exception of the three or four innermost quills) are red, margined with black, the shafts of these feathers are also black. The outer primary is black, and the two or three following feathers are broadly margined externally with the same colour. All the wing feathers are black at the base, on the outermost feathers the

black colouring occupies but little space, but in each successive feather it increases in extent. The feathers of the tail are of a very dark green colour above, inclining to black, beneath they are black but exhibit indistinct purple reflections. The rump, upper and under tail coverts, thighs and vent are black obscurely tinted with purple or green in parts. The tarsi are black. The eyes are hazel and the naked, or almost naked, space around the eye is of a crimson colour, not carunculated, as in *C. Buffoni* and *C. leucotis*.

A highly-interesting and valuable series of specimens of the Paper Nautilus (*Argonauta Argo*) consisting of the animals and their shells of various sizes, of ova in various stages of development, and of fractured shells in different stages of reparation were exhibited and commented on by Professor Owen, to whom they had been transmitted for that purpose by Madame Jeanette Power. Mr Owen stated that these specimens formed part of a large collection illustrative of the natural history of the Argonaut and bearing especially on the long debated question of the right of the Cephalopod inhabiting the Argonaut shell to be considered as the true fabricator of that shell.

This collection was formed by Madame Power in Sicily in the year 1838 during which period she was engaged in repeating her experiments and observations on the Argonaut having then full cognizance of the nature of the little parasite (*Hectocotylus*, Cuv.) which had misled her in regard to the development of the Argonaut in a previous suite of experiments described by her in the Transactions of the Gælian Academy for 1836.

As this mistake had been somewhat illogically dwelt on to depreciate the value of other observations detailed in Madame Power's Memoir, Mr Owen observed, that it was highly satisfactory to find that the most important of the statements in that memoir had been subsequently repeated and confirmed by an able French malacologist, M. Sander Rang.

The collection of Argonauts,—Cephalopods and shells,—preserved in spirits, included twenty specimens at different periods of growth the smallest having a shell weighing not more than one grain and a half, the remainder increasing, by small gradations, to the common sized mature individual.

The inductions which the present collection of Argonauts of different ages and sizes legitimately sustained were in exact accordance with Madame Power's belief that the Cephalopod was the true constructor of the shell, while no contradictory inference had been, or could be, deduced from an examination of the specimens themselves.

With reference to the second suite of specimens viz the ova of the Argonaut in different stages of development, Mr Owen entered into a detailed account of the new and interesting facts which they revealed. In the ova most advanced the distinction of head and body was established the pigment of the eyes the ink in the ink bladder the pigmental spots on the skin, were distinctly developed the siphon the beak—which was colourless and almost transparent—and the arms were also discernible by a low microscopic power the arms were short and simple the secreting membranes of the shell were not developed and of the shell itself there was no trace.

Mr Owen then recapitulated as follows the evidence which independently of any preconceived theory or statement, could be deduced from the admirable collection of *Argonauta Argo* due to the labours of the accomplished lady who had contributed so materially to the elucidation of a problem which had divided the zoological world from the time of Aristotle.

1st The Cephalopod of the Argonaut constantly maintains the same relative position in its shell.

2nd The young Cephalopod manifests the same concordance between the form of its body and that of the shell and the same perfect adaptation of the one to the other, as do the young of other testaceous Mollusks.

3rd The young Cephalopod entirely fills the cavity of its shell the fundus of the sac begins to be withdrawn from the apex of the shell only when the ovarium begins to enlarge under the sexual stimulus.

4th The shell of the Argonaut corresponds in size with that of its inhabitant whatever be the differences in the latter in that respect (The observations of Poli, of Prevost and myself on a series of *Argonauta rufa* before cited are to the same effect.)

5th The shell of the Argonaut possesses all the requisite flexibility and elasticity which the mechanism of respiration and locomotion in the inhabitant requires it is also permeable to light.

6th The Cephalopod inhabiting the Argonaut repairs the fractures of its shell with a material having the same chemical composition as the original shell and differing in mechanical properties only in being a little more opaque.

7th The repairing material is laid on from without the shell, as it should be according to the theory of the function of the membranous arms as calcifying organs.

8th When the embryo of the Argonaut has reached an advanced stage of development *in ovo*, neither the membranous arms nor shell are developed.

9th The shell of the Argonaut does not present any distinctly defined nucleus

Mr Owen finally proceeded to consider the validity of the best and latest arguments advanced in favour of the parasitism of the Cephalopod of the Argonaut

Finally Mr Owen proceeded to state in detail the points which still remained to be elucidated in the natural history of this most interesting Mollusk Among other experiments he suggested that the young Argonaut should be deprived of one of the velated arms, and preserved in a marine vivarium with the view to determine the influence which such mutilation might have on the future growth of the shell but in proposing further experiments and while admitting that the period of the first formation of the shell yet remained to be determined Mr Owen stated that he regarded the facts already ascertained to be decisive in proof that the Cephalopod of the Argonaut was the true fabricator of its shell

March 12 The notice of M Temminck's letter and the second part of Dr Cuvier's paper read this day have been inserted above pp 273 341

April 9, 1839 — The Rev F W Hope in the Chair

A collection of beautifully finished drawings of Tasmanian Fishes was exhibited to the Members present these drawings having been sent to the Society by Dr Lhotsky for that purpose In a letter accompanying these drawings, Dr Lhotsky stated that they had all been executed, under his own superintendence from fresh specimens

A new species of Hamster was exhibited by Mr Waterhouse and characterized as follows

CRICETUS AURATUS *Cri. aureo-fuscescens subtus albidus pilis mollissimis supra ad basin plumbeis subtus ad basin cinereis auribus mediocribus rotundis cauda brevissima pilis albis obsita*

	unc	lin
Longitudo ab apice rostri ad caudæ basin	7	6
cauda	0	5
ab apice rostri ad basin auris	1	6
tarsi digitorumque	0	10
auris	0	7

Hab Aleppo

This species is less than the common Hamster (*Cricetus vulgaris*) and is remarkable for its deep golden yellow colouring The fur is moderately long and very soft, and has a silk like gloss the deep golden yellow colouring extends over the upper parts and sides of the head and body and also over the outer side of the limbs on the back, the hairs are brownish at the tip hence in this part the fur assumes a deeper hue than on the sides of the body the sides

of the muzzle, throat, and under parts of the body are white, but faintly tinted with yellow on the back and sides of the body all the hairs are of a deep gray or lead colour at the base, and on the under parts of the body, the hairs are indistinctly tinted with gray at the base. The feet and tail are white. The ears are of moderate size, furnished externally with deep golden-coloured hairs and internally with whitish hairs. The moustaches consist of black and white hairs intermixed.

The skull, when compared with that of *Cricetus vulgaris*, differs in not having the anterior root of the zygomatic arch produced anteriorly in the form of a thin plate which in that animal as in the Rats, serves to protect an opening which is connected with the nasal cavity. The facial portion of the skull is proportionately longer and narrower. In size there is much difference, the skull of *Cricetus auratus* being one inch and six lines in length and ten lines in breadth, measuring from the outer side of the zygomatic arches.

April 23, 1839 — William H. Lloyd, Esq., in the Chair

A letter was read from Dr. Weissenborn, dated Weimar February 19 1839. It accompanied a female specimen of the Hamster (*Cricetus vulgaris*), which he begged to present to the Society, and related to some longitudinal naked (or nearly naked) marks which are observable on the hips of that animal.

These marks, Dr. Weissenborn states, are found in every Hamster, though usually hidden by the long fur which surrounds them, and the common opinion of the furriers (who have to cut them out and to replace the skin) is, that they arise from friction. Being situated over the hip bones, and therefore more exposed than other parts, the hair is worn whilst the animal is moving in its burrow. This is the opinion also of the earlier authors, but is however erroneous, as remarked already by Dr. Sulzer in his valuable monograph on this species, published at Gotha in 1774. These spots are visible the very moment the hair begins to grow, in the naked young, and they are the very places where the growth of the hair becomes first apparent. At this early stage of the animal's life, they appear on the inner side of the skin, when viewed by transmitted or reflected light, as two dark spots. When all the hair is developed the case is reversed, and these spots appear paler than the rest of the skin. Dr. Sulzer confesses himself to be quite ignorant of the part which these peculiar spots act in the œconomy of the animal, and no subsequent author has explained the subject. I imagine no person, after Sulzer, has turned his attention seriously to it, but it is to be wondered that he was not more successful, being

an accurate and clever observer. The reason why the Hamster is furnished with these spots appears to me very far from being mysterious, and had the cause not been mistaken for the effect, I think anybody might have hit upon the idea, that nature had made the short, stiff, and closely adpressed hairs, to grow upon these spots of the Hamster's body, *which are most exposed to friction* and at the same time contiguous to bone, that the hair and the skin might be competent to stand the wear and tear to which they necessarily are subjected in the narrow burrow of an animal which is very brisk in its movements, and no doubt the skin which gives rise to a different kind of hair, is of a different structure from the rest and as this hair is more stiff, the skin which it covers is probably more callous.

In the present state of the science of physiology, it may be impossible to state with sufficient precision the conditions on which the peculiar structure of the skin and hair, in these particular spots, depends. The relation in which the latter stand to the hip bones by peculiar tissues may perhaps help to explain the circumstance, as the neighbourhood of, and connexion with, bony structures have an evident influence on the nature of the skin and its productions.

Mr Waterhouse remarked that the description which Dr Weissenborn had given of the peculiar spots on the hips of the Hamster caused him to suspect that they were glands analogous to those observable in the Shrews, and might help the animals to distinguish each other in their dark burrows.

Mr Waterhouse exhibited two specimens of a species of Lark from China, which had recently died in the Society's Menagerie having been presented to the Society by J R Reeves Esq. It was characterized as follows.

ALAUDA SINENSIS Al. *suprà rufo fusca subtus alba fasciâ latâ pectorali nigra, lineâ sordide albâ ab oculis ad occiput extendâ, fronte, nuchâ, et humeris castaneis, remigibus primariis nigris, marginibus externis angustè fuscescenti albis, remige primo illo externe marginato, caudâ nigra, rectrice utrinque externa alba ad basin nigro lavatâ proximâ utrinque albo marginatâ, rectricibus intermediis duabus fuscescentibus*

Long tot 8 unc, rostri, $\frac{3}{4}$, alæ, 5, caudæ, $3\frac{1}{4}$, tarsi 10 lin
Hab apud Sinam.

The Chinese Lark very much resembles, and is nearly allied to the *Alauda Calandra* of authors but differs in the following particulars. The beak is more compressed, and the upper mandible has two longitudinal grooves on each side, the upper one of which gives a keel like edge to the culmen, the tail is proportionately longer the tarsi are shorter, the feet are smaller, and the hinder claws, in-

stead of being bent downwards are slightly recurved* In the colouring there are also points of distinction in lieu of the dull brown tint on the top of the head and back, the present species possesses rich rufous brown feathers In one specimen the body is yellowish white beneath but in the other it is pure white

Mr Waterhouse then proceeded to make some observations upon a series of skulls of Rodents which were upon the table These skulls belonged chiefly to species of the various genera contained in the families *Chinchillidæ* (consisting of the genera *Chinchilla*, *Lagotis* and *Lagostomus*) and *Caviidæ*—composed of the genera *Cavia*, *Kerodon*, *Dolichotis*, and *Hydrochaeris* Numerous points of resemblance between these two families were dwelt upon, more particularly in the structure of the teeth the form of the palate the contracted glenoid cavity, the form of the lower jaw, and direction of the lower pair of incisors The *Caviidæ* however possess certain characters independent of those observable in the form of the teeth which renders it easy to distinguish them from the *Chinchillidæ* He alluded especially to the shortness of the condyloid process of the lower jaw the forward position of the coronoid process the peculiar projecting ridge on the outer side of the horizontal ramus, and the form of the descending ramus or angle of the jaw, this projects considerably beyond the line of the coronoid process whereas in the *Chinchillidæ* it terminates in a line with the posterior portion of the coronoid process, or projects but slightly beyond that line

Among the *Chinchillidæ*, the *Lagostomus trichodactylus*, observes Mr Waterhouse approaches most nearly to the *Cavies* the angle of the lower jaw being less acute and the coronoid process more forward than in the other species

In the imperfect state of the palate the narrowness of the anterior and posterior sphenoids the form of the occipital condyles, the form of the articular portion of the lower jaw, and the almost horizontal direction of the incisors of the lower jaw of the *Chinchillas* and *Cavies* Mr Waterhouse stated he had found characters which induced him to place those animals next before the *Leporidae*

May 14 Mr Cunningham's account of the *Apteryx* and Mr Hope's Monograph of *Euchloris* have been inserted above, pp 312 342

May 28 — William Ogilby, Esq in the Chair

A paper from the Rev R F Lowe was read, entitled "A Supplement to the Synopsis of the Fishes of Madeira," inserted above, p 405

* "This difference in the form of the claw cannot be depended on, as the birds have been for some time in confinement, they *may* originally have been straight, but I think they never could have been curved downwards'

June 11 — William Yarrell, Esq., Vice President, in the Chair

Mr Bucknell exhibited his *Eccalobion* or machine for hatching eggs and having broken eggs in every stage of incubation, explained the nature and incidents of the process. Mr Bucknell stated that the period of incubation in the common fowl which was on an average 21 days sometimes varied from 18 to 24 days and that he attributed this variation to the mode of keeping and previous treatment by which the embryo was injured, either from the heat of the weather exposure to variety of temperature jolting in carriage &c. The young bird was occasionally known to emit a faint chirp even so long as 24 hours before being excluded and he believed that if this noise was heard on the 18th day the chickens would probably appear on the 19th. From this and other circumstances such as the common mode of preparing eggs by washing, &c., the porosity of the shell and other similar causes he concluded that the small globule of air constantly found in eggs and which he had observed to increase according to the age of the egg was produced by the air penetrating the substance of the shell and its lining membrane.

The average number of malformations according to Mr Bucknell's experience was not more than five in a thousand though in Egypt it was stated, that malformations were extremely common in the artificial process of incubation. He attributed this circumstance to an excess of heat and generally found it to affect the toes and extremities, sometimes also the muscles of the neck.

A general conversation afterwards took place on this subject, during which much interesting and valuable information was extracted with regard to the period and circumstances of the incubation.

A letter from H. Cuming Esq., Corr. Memb. dated Manila, November 18, 1837, was read. This letter stated that Mr Cuming had forwarded a collection containing 395 birds and 12 quadrupeds from the southern part of the Island of Luzon.

Mr Cuming states that quadrupeds are scarce in the Philippine Islands, and that he has been able to procure all the species known excepting three, two of which are Deer, and the third is a species of Buffalo, of small size with straight and sharply pointed horns. This last animal Mr Ogilby stated was most probably the *Anoa depressicornis*.

Mr Ogilby exhibited the skull of an Elk from Nova Scotia, brought over by Dr Cox, and remarkable for its great size as compared with the dimensions of the horns.

Mr Ogilby also called the attention of the meeting to a collection of skins from Sierra Leone, exhibited by Mr Garnett. Among others were three of the Chimpanzee, apparently adult, but too much mutilated to admit of obtaining the dimensions, two of *Colobus ursinus*, one of which had the tail of a rusty white colour, instead of the pure white which generally characterizes the species, and one of a species of Cat, which Mr Ogilby believed to be undescribed, and for which he proposed the name of

FELIS SERVALINA *F supra fulva, maculis nigris, minutis, copiosissimis, subtus albida, cauda brevissima*

" This species appears to be about the size of the common Serval, but differs from that animal in having a shorter tail, and in the very numerous and minute black spots which are scattered over the shoulders, back, and flanks. It is only on the thighs and arms that the spots become large and distinct, there they are less numerous, and resemble those of *Felis Serval*. The head and fore part of shoulders are entirely free from spots, the median line of the back is of a deeper fawn than the rest of the body, the minute spots having a particular tendency to run into lines, the belly is of a dirty white colour, with large brown blotches, and the tail does not exceed the length of the same organ in the lynxes. This character is alone sufficient to distinguish the present species from all the other African cats with which I am acquainted. The mutilated condition of the skin unfortunately prevents me from describing the characters of the ears, legs, feet, and under parts of the body."

	Ft	In
Length of the skin from the muzzle to the root of the tail	2	10
Length of the tail	0	8

As regards the species of *Colobus*, Mr Ogilby observed, that from information communicated by M Temminck, he was now convinced that it was identical with the *Colobus polycomos* of Pennant.

Mr P Buckley Williams exhibited various specimens of White-Bait (*Clupea alba*, Yarrell,) from the Dovey and some other rivers of North Wales, and stated that the common belief, that this was confined to the Thames, was now proved to be erroneous, not only from the facts now stated, but likewise from their abundance in the river Forth of Scotland, as shown by Dr Parnell.

June 25, 1839 —Dr Bostock in the Chair

Dr Richardson read his account of an interesting collection of Fish formed at Port Arthur in Van Diemen's Land, by T J Lempriere, Esq, Deputy Assistant Commissary General, by directions

from His Excellency Sir John Franklin, K C B Lieutenant Governor, and now deposited in the museum of the Royal Naval Hospital at Haslar. The collection contains about thirty species and the paper which embraces only a part gives detailed descriptions and anatomical notices of these several of them being also illustrated by very elaborate drawings, executed by Mr Charles M Curtis with his wonted fidelity. The following species are included in the present paper, the others being reserved for a future communication.

- 1 *SERRANUS RASOR* *Ser. maxillis valde squamosis, apicibus radiorum pectoralium fasciculatis, compressis, lanceolatis, pinnis omnibus præter ventralis squamosis, radius aculeatis pinnæ dorsi subæqualibus, fascia oculum cingenti ærula per lineam lateralem producta*

Radu —Br 7—7, P 13, V 15, D 10 21 A 3 9 C 15½

The *Serranus Rasor*, or *Tasmanian barber* is a beautiful fish belonging to that group of *Serrani* which was named *Anthias* by Bloch, none of which had previously been described as inhabitants of the Australian seas. It agrees with the barber-fish of the Caribbean seas in having no elongated dorsal rays, and may be distinguished readily from all the known *Serrani* by the peculiar form of its pectoral rays, whose numerous branchlets are so graduated and closely approximated as to give a flat lanceolate shape to the tip of each ray. The general colour of the fish is reddish brown, withumber brown spots, a dark patch beneath the end of the pectorals, a bright blue stripe crossing the anterior suborbital, encircling the eye, and running along the lateral line to the caudal fin. There are also thirteen or fourteen narrower blue streaks on the lower part of the flanks and tail. The fins are all red and are all except the ventrals, more or less scaly.

- 2 *CENTROPRISTIS SALAR* *Cent. operculo suboperculoque squamosis, interoperculo scinnulo, preoperculo subdentaculato, pinnis dorsi anique in fossis receptis*

Radu —Br 7—7, P 16, D 9, 16, V 1, 5, A 3, 10, C 17½

This species is known locally as the salmon and differs from *C. truttaceus*, as described in the *Histoire des Poissons*, in the distribution of the scales on the gill-covers, and in some other minute particulars. *Truttaceus* is said to have the interoperculum and suboperculum entirely naked, and only a few scales on the operculum itself ("quelques écailles sur sa surface"). In *C. salar* there are five rows of pretty large scales on the operculum, one row on the suboperculum, covering surfaces of both these bones and a row of smaller scales on the interoperculum, clothing its upper half only.

As these scales are very easily detached, and the gill plates remain hard and silvery after they are removed with the epidermis, it must be difficult to distinguish an injured specimen from *truttaceus*, whose description in other respects exactly accords with *salar*, except that the latter has the suborbital very faintly denticulated, and two rays fewer in the soft dorsal

3 *APLODACTYLUS ARCTIDENS* *Aplo* *dentibus oris tricuspidatis, superioribus in serie octuplici, inferioribus in serie quintuplici dispositis, cæcis pylori quatuor*

Radu —B₁ 6—6 P 9 et 6, V 1 5 D 16 -1, 17 A 3 8
C 16½

This species differs from *A. punctatus* of the Chilean seas (the only species previously known) in its dentition, but resembles it so much in external form colours, and markings, as well as in anatomical structure, that it cannot be placed in a separate genus. In the *Histoire des Poissons* the teeth of *dentatus* are described as follows:—*“ Les dents sont disposées sur trois rangées à la mâchoire supérieure et sur deux à l’inférieure elles sont aplaties et ont leur bords arrondis et dentelés en petits festons, elles sont très semblables à celles des crépidens, on en compte quatorze de chaque côté à la mâchoire supérieure et treize à l’inférieure. Derrière ces rangées antérieures il y a des petites dents grenues sur une bande étroite à chaque mâchoire ”* In the Van Diemen’s Land fish, the teeth stand in eight or nine crowded ranks in the upper jaw, and in five or six in the lower one, those of the interior rows being very much smaller in all their dimensions but otherwise shaped exactly like the teeth of the exterior rows, which resemble those of *punctatus*. Their points show three small lobes the middle lobe being largest and most prominent. The species further differs from *punctatus* in having four cæca but its food appears to be similar the intestines having been found filled with large fragments of sea weed, apparently *Ulva umbilicalis*.

4 and 5 Two new species of gurnard were then mentioned as the first of the genus that have been brought from the Australian coasts though one species (*Trigla kumu*) is known to inhabit the seas of New Zealand. They were stated to agree with that species, with several Indian ones, and with *Trigla paciloptera* of the Mediterranean, in their large pectoral fins being ornamented with eye-like marks similar to those on the wings of some lepidopterous insects. One of them, *TRIGLA POLYOMMATA*, has minute cycloid scales on the body, an unarmed lateral line and the dorsal plates confined to the first dorsal, there being no dilatation whatever of the interspinous bones of the second dorsal. All the spines of the head are stiletto-shaped, and one whose base occupies the whole anterior end of the

infraorbital on each side, projects boldly beyond the snout, and gives the fish a very different aspect from any other known gurnard

The other may be thus characterized —

5 *TRIGLA VANESSA* *Tri squamis aspersis mediocribus, lined laterali aculeatâ, fossa dorsali ad finem usque pinnae posterioris armata, orbitâ oculi edentata, pinna pectorali amplâ labeculis aculeis binis ornata, macula inter aculeum pinnae dorsi quantum et octavum nigra*

Radu — Br 7—7, P 12—III V 1, 5 D 8, 12, A 12, C 13½

Trigla Vanessa has a spinous infraorbital tooth larger than usual in gurnards, though not so remarkable as in the preceding species and not occupying the whole end of the bone there being a smaller tooth and some granulations beneath it The arming of the dorsal furrow extends to both fins, and is formed by saddle-shaped dilations of the interspinous bones, with a triangular spinous tooth on each side of each plate directed backwards The scales of the body are rather large, and are studded on their uncovered portions with minute spiny points, those forming the lateral line are tubular both transversely and longitudinally, and are armed with several strong spines also tubular There is a black mark on the anterior dorsal The sides of the head are finely granulated without radiations, and there are no denticulations on the edge of the orbit either in this or the preceding species

6 *Apistes marmoratus* (Cuv et Val 4 p 416) The specimens correspond exactly with the description given in the work referred to, except that the first suborbital has only one tooth anteriorly The spine of that bone reaches in one specimen to the preoperculum, but in another it is one third shorter being in the latter case only just equal to the preopercular spine in length

7 *Sebastes maculatus* (Cuv et Val) Two specimens in good order, when examined in reference to the account of the species in the work referred to, offer no discrepancy, except that the postorbital spines are somewhat different from those of *imperialis*, which *maculatus* is said closely to resemble *S maculatus* is an inhabitant of the seas of the Cape of Good Hope, and although a range from thence to Van Diemen's Land may appear very great, it is not more extensive than that of the northern *sebastes* which has been taken on the coasts of Greenland, in the gulf of St Lawrence, on the coast of Norway, and in the British Channel

8 *Cheilodactylus carponemus* (Cuv et Val), known locally as the Perch, and described as having, when fresh, a bright silvery hue with dark spots

9 *NEMADACTYLUS CONCINNUS* The fish so designated is stated by

the author to be one of those species whose natural position is difficult to ascertain, from their partaking of the characters of several different groups. Viewed as the type of a new genus, *Nemadactylus* may be characterized as having none of the bones of the gill-cover armed or sculptured, the operculum itself being destitute of projecting points but as differing from any described sparoid form in having simple inferior pectoral rays, one of them projecting beyond the rest, as in *Cheilodactylus*, and in the teeth, which are minute and slender, in a single row on the jaws. The palate, vomer, tongue, and pharyngeal parietes are toothless. The fins are scaleless, the dorsal single, the branchial rays only three in number, the scales cycloid, and the pyloric cæca few (three). There is but one specimen of *Nemadactylus concinnus* in the collection, which is three inches and a half long, has a compressed elliptical form, and a sparoid aspect. Its lateral line is marked by a series of bright thin scales, and beneath it, the integuments are merely silvery with wrinkles, as in some scomberoid fishes, but the specimen has been long in spirits with other fish, and it is possible that the scales of the flanks may have been detached. If they actually existed, they must have been proportionably larger than those on the back, judging from the wrinkles of the epidermis. The scales of the back and top of the head are small, thin, and delicate, like those of a mackerel. Vertebræ 34.

It may be thus characterized —

NEMADACTYLUS, n. g.

Piscis acanthopterygius. Operculum læve inermis. Pinnae squamosæ, pinnâ dorsalis unicâ. Radii pinnæ pectoralis inferiores (sex) simplices, quorum unus productus. Costæ branchiostegæ paucæ (tres). Intermaxillarum pediculi breves. Dentes gracillimi minuti in ambitu oris tantum positi. Fauces palatum et lingua glabri. Squamæ teneræ, læves, infraque lineam lateralem scomberoideæ. Cæca pylorica pauca (tria).

N. concinnus, species unica adhuc cognita.

Radii — Br 3—3, P 9 et 6, V 1, 5, D 17, 28, A 3, 15, C 15½.

10. LATRIS HECATEIA is the appellation given by the author to the type of another annectant genus, which he considers as taking its position most naturally among the *Mænoideæ*, but as having many characters in common with a percoid group composed of the genera *Therapon*, *Datnia*, *Pelates*, *Helotes* and *Nandus*. In *Latris* the mouth is moderately protractile; the dentition is similar to that of *Mæna vomerina*, there is a scaly groove for the reception of the deeply notched dorsal as in *Gerres*, which genus it further resembles in its

opercular bones, the preoperculum being very finely denticulated, and the operculum terminated by a slightly concave line without projecting angles. The ventrals are still further back than in *Cæcio*, and the cæca are few in number. The scales are cycloid, without teeth or cilia, and the genus, unlike any previously described mænoid group, has the lower pectoral rays simple like those of *aplodactylus*. There are no elongated scales at the base of the ventrals. *Latris Hecateia* is marked by three well-defined dark stripes on each side of the back, with a more diffused one inferiorly on the flanks, the four pyloric cæca are short and wide, and the only specimen in the collection is eleven inches long, which is said to be the ordinary size.

The principal characters of this genus are as follows —

LATRIS, n g

Piscis acanthopterygius, mænoideus. *Pinnæ* esquamosæ dorsi pinnâ unicâ, profunde emarginatâ, in fossâ decumbens. *ventrales* pinnæ sub abdomine medio positæ. *Radii* pinnæ pectoralis inferiores (novem) simplices. *Preoperculum* denticulatum. *Os* modicè protendens. *Dentes* in oris ambitu tignoque vomeris positi villosi, in ossiculis pharyngeis parvi, subulati, conferti. *Palatum* lingue læves. *Squamæ* læves.

L. Hecateia, species unica detecta

Radii — Br 6—6, P 9 et 9, V 1, 5, D 18, 36, A 3, 27

11. *THYRSITES ALTIVELIS*. *Thyr radus pinnæ dorsi aculeatis, corpus altitudine æquantibus, dentibus intermaxillæ utriusque quatuordecim, in latere maxillæ inferioris utroque duodecim*

Radii — Br 7—7, P 14, V 1, 6, D 20—1, 11 et VII, A 1, 10 & VII, C 17½

A single specimen of this fish in the collection, agrees in most particulars with the description of *Thyr sites atten* in the *Histoire des Poissons*, but the spinous rays of the dorsal fin are considerably higher in proportion, and the teeth on the jaws much fewer.

12. *BLENNIUS TASMANIUS* is an undescribed species strongly resembling some of the European ones.

13. *CLINUS DESPICILLATUS* differs from *C. perspicillatus* of the *Histoire des Poissons* in possessing a thicker form, a larger head, a proportionably smaller eye, and in wanting the nuchal marks which give the name to that species. The marks on the body are arranged as in *perspicillatus*, but there are three transverse bands on the pectoral and caudal fins, with many other spots not mentioned in the description of the latter. The dorsal rays are 36, 4, and in other particulars the two fish seem to be much alike.

14. *LABRUS LATICLAVIUS*. *Lab smaragdinus, fascus binis late-*

ralibus puniceis purpureo marginatis, postice in unum coalescentibus, inque pinna productis, pinna dorsi basi virida, in mediate purpuria superne aurantiaca, purpureo guttatâ, inque margine extremo cærulea, pinna ani basi aurantiaca, dein primulaceo flava, utrinque cæruleo cincta, exinde purpureâ cæruleo guttata, denique in extremo margine cæruleâ

Radu —P 12, V 1 5 D 9 11 A 3, 10 C 14

This is a very handsome species, having a duck green colour, with two lake-red stripes, commencing at the gill-opening and uniting opposite the end of the dorsal to form a single broader stripe which is continued into the caudal fin. These stripes are bordered on both sides by dotted lines of plum-blue and there are also five rows of blue spots on the sides of the belly, and three rows near the base of the anal fin, on a lake-red ground. Several purple lines radiate from all sides of the orbit, and some pass over the preoperculum interoperculum and lower jaw. The dorsal is dark-purple with green at the base of the rays and an orange band at the tips, spotted and finally edged with blue. The anal has an orange streak along its base then a broad primrose yellow band edged above and below by a narrow blue line, next a broad band of purple with many very regular blue spots, and finally a narrow blue edging. The caudal is purple, with many plum-blue spots near its extremity in a vertical band. The other fins are apparently colourless. The aspect of the fish is that of a *Julis*, but the operculum and cheeks are scaly.

15 *LEPIDOLEPRUS AUSTRALIS* *Lep squamis corporis ordinibus plurimis aculeorum arcte incumbentium instructis, pinna ani plus duplici altitudine pinnam dorsi posteriorem superante*

Radu —Br 6—6, P 16 V 1, 6, D 2, 11—89, C 1

This is an example of a genus which had not previously been detected in the southern hemisphere. It has the general form of *Lepidoleprus calorhynchus*, but there are abundant specific differences, especially in the relative size of the fins, and in the arming of the scales which in the Antarctic fish consists of rows of closely-incumbent strong spines. The author has compared it with examples of *calorhynchus* from the Mediterranean, and also from Madeira, both in the Society's museum, whose scales are totally different. None of these examples have the first dorsal ray serrated, as it is stated to be by writers who have described and figured the Greenland and Iceland *Macrourus rupestris*, yet Cuvier states that he has ascertained the identity of the latter with the Mediterranean fish. The first dorsal ray of *L. australis* is also smooth. There are sixty-seven vertebrae of which fourteen are abdominal. The collection contained three specimens.

A *Platycephalus* intermediate between *fuscus* and *grandispinis*, a

Scorpaena & *Cheironectes* which is figured in Ross's Annual for 1835, a *Dajaus* closely resembling its American prototypes, several handsome *Balistes* and *Monacanthi*, a *Diodon* and several *Tetrodontes*, a new form of *Torpedo*, some fresh water fishes, and several other sea ones, are reserved for a future communication

GEOLOGICAL SOCIETY

Nov 6, 1839 —A paper was read, ' On the relative ages of the tertiary and post-tertiary deposits of the Basin of the Clyde,' by James Smith, Esq of Jordan Hill, F G S .

In former memoirs, Mr Smith described the indications which he had observed of changes in the relative level of sea and land in the basin of the Clyde, by which deposits had been laid dry during an extremely recent geological epoch*, and the evidences adduced by the arctic character of several of the shells, that the climate of Scotland was colder while these beds were accumulating than it is at present† In this paper he confines his remarks to the results of subsequent observations, which prove that in these comparative modern deposits there are two distinct formations differing in climate and the character of their fauna, and separated by a wide interval of time In the lower or older of these formations, Mr Smith has found from 10 to 15 per cent of extinct or unknown species, and he accordingly places it in Mr Lyell's proposed pleistocene system, whilst in the upper or newer he has found only one species which exists in the present seas, and he accordingly ranges it among the post tertiary formations of that author Both these deposits, however are anterior to the recent or human period

In the lower or pleistocene formation Mr Smith includes the "till" or unstratified accumulation of clay and boulders, and the overlying beds of sand gravel and clay containing a mixture of unknown species of shells He is of opinion that the beds presenting the same order of superposition in the basins of the Forth and the Tay, including the submarine forest of the latter, will be found to be of the same age, though nothing at present is known of their fossils, except the discovery in the elevated beds of the Tay of the *Nucula corbuloides* by Mr Lyell, and that the parallel roads of Glenroy, recently shown by Mr Darwin to be of marine origin may be of cotemporaneous formation Mr Smith is also convinced, that a very great proportion of the superficial beds of sand, gravel, and clay are tertiary, although the evidence must sometimes be uncertain, owing to the want of organic remains .

* Proceedings vol ii p 427 † *Ibid* vol iii p 118 See also Mr Smith's paper in the Wernerian Society's Transactions, vol viii

During the post-tertiary period, Mr Smith is of opinion, an elevating movement to the extent of 40 feet took place, and that at this height, the relative level of sea and land remained stationary for a considerable time, exceeding the present period of repose. The proof of this, he states, is a magnificent range of inland sea cliffs, with beds of gravel and sand interposed between them and the sea*. At first Mr Smith supposed that the beds of this period contained a small proportion of unknown species, latterly, however, he reduced the number to one, the *Arca papillosa*, which has within a few weeks been discovered recent by Capt Portlock on the coast of Ireland.

During the existing geological epoch no change of level appears to have taken place in the Basin of the Clyde†

To the paper is appended a list of the shells found in these beds, but not known as inhabitants of the British seas, and of which the following is a summary —

Fossil in the Basin of the Clyde	Fossil in other localities	Recent in the Arctic Seas
<i>Tellina proxima</i>		
<i>Crassina multcostata</i>	Norway and Sweden	
<i>Witham</i>	Wirk and Bridlington	Rothsay Bay
<i>borealis</i>	Dalmuir	Arctic Seas
<i>Mya truncata</i> , var ?	Uddevalla, Canada	St Lawrence
<i>Pecten Islandicus</i>		{ North Seas, coast of
<i>Nucula oblonga</i>		{ Newfoundland
<i>antiqua</i>		
<i>coarbuloides</i>	Dundee, crag of Norwich	
<i>Mactra striata</i>		
<i>Saxicava sulcata</i>		
<i>Panopæa Bignonæ</i>	Crag, Sicily	Yorkshire coast
<i>Natica clausa</i>	Uddevalla	{ North Seas, coast of
<i>glaucinoides</i>		{ Newfoundland
<i>fragilis</i>	Crag	
<i>Nassa Monensis</i>	Isle of Man	
<i>Buccinum granulatum</i>	Crag	
<i>striatum</i>		
<i>Trochus inflatus</i>		
<i>Turbo expansus</i>	. .	Arctic Seas
<i>Velutina undata</i>		{ North Seas, coast of
<i>Fusus Peruvianus</i>	Crag	{ Newfoundland
<i>imbricatus</i>		Arctic Seas
<i>Bulbus Smithi</i>		

Nov 20 — An extract from a letter addressed to Dr Andrew Smith by A G Bain, Esq, dated Graham Town, Cape of Good Hope, Feb 21st, 1839, and communicated by Ch Darwin, Esq, was first read.

The object of this extract is to announce the discovery, by Mr Martin Smith, of the piths and portions of the head of an ox in the alluvial banks of the Modder, one of the tributaries of the Orange

* Proceedings, vol II p. 428.

† *Ibid*, vol II p. 428.

river, and 40 feet below the surface of the ground. The piths with the breadth across the *os frontis* measured 11 feet 7 inches, but it is calculated that 5 inches had been broken off the end of each tip, and the circumference of the piths at the root was 18 inches. The orbits were situated immediately under the base of the horns. Part of the upper jaw, containing five molar teeth and other fragments of the head, as well as a cervical vertebra, were found at the same time.

A notice on the Fossil Fishes of the Yorkshire and Lancashire Coal-fields, by W. C. Williamson, Esq., was then read.

About four years ago Mr Williamson first met with remains of fishes in the coal-measures of Lancashire. Nearly at the same time Sir Philip Grey Egerton detected them in the Staffordshire fields. Mr Hutton had previously found them near Newcastle, Dr Hibbert Ware had brought them before the public in Scotland, Mr Bowman had detected scales of *Holoptychus* in Wales, and two or three instances had been noticed of their existence in the coal-fields of Yorkshire. Since that period, however, the coal-measures of Lancashire and Yorkshire have proved to be exceedingly rich in Ichthyolites. In the former they occur throughout the whole series from the Ardwick limestone to the millstone grit, and at Middleton colliery, near Leeds, they have also been found in considerable quantity. At that locality there are three seams of coal, but only two are wrought. The following is a general section of the pits —

Fish coal	14 inches
Interval	60 yards
Yard coal	3 feet
Interval	32 yards
Main coal	4½ feet

Ichthyolites occur in the shale in connexion with all the seams, but principally in the uppermost one, to which the colliers have in consequence given the name of Fish Coal. They are contained in a fine bituminous shale, and in greatest abundance at the junction of the roof with the coal, where a very thin seam of coprolitic matter occurs. The author has obtained from it the following remains —

Teeth of *Diplodus gibbosus* and *Ctenoptychus pectinatus*, scales, jaws, and teeth of *Megalichthys Hibberti*, and of another smaller species, rays of *Gyracanthus formosus*, scales, fins, and other portions of two species of *Holoptychus*, of a species of *Acanthodes*, or *Cheiracanthus*? of a species of *Platysomus*, three kinds of Ichthyodorulites, and other remains of which he has not yet determined the genera.

In the shale of the main coal Ichthyolites are much less abundant, but they are remarkable for their great size. They occur in a

coarser shale and consist chiefly of large teeth and vertebrae of a species of *Holoptychus* and rays of *Gyracanthus*

The yard coal shale is still less fruitful than either of the other seams and has yielded only a few small teeth of *Holoptychus*, *Ctenoptychus*, and some other unimportant fragments

On comparing these fossils with the *Ichthyolites* which he has found in Lancashire, the author has ascertained that many are identical, but that others differ. The species of *Diplopus*, *Ctenoptychus*, *Megalichthys*, *Gyracanthus*, one of *Holoptychus*? and *Platysomus*? exactly correspond in each district. In the Lancashire field he has found remains of *Ctenoptychus apicalis* and *C. denticulatus* which he has not noticed in the Yorkshire, and he is inclined to think, that the former field is characterized, if there be a difference, by the greater prevalence of *Lepidoid* fishes, and the latter by those of the *Saurioid* family

The *Ichthyolites* occur chiefly in highly bituminous shales, with the exception of the Ardwick limestone, and most abundantly where it is finely grained. They are rarely associated with any quantity of vegetable remains, and this disposition of the two kingdoms, Mr Williamson is of opinion may assist in determining the conditions under which the coal measures were deposited. The *Ichthyolites* also are in general more common in the roof than the floor of the coal, but in the cannel seams of Wigan in Lancashire, and in the thin seams connected with the limestones at Ardwick, they are most abundant in the floor. They are rarely found in the coal itself, and the instances in which they have been met with in that position by the author, have been chiefly in the Middleton colliery

The manner in which *Ichthyolites* are associated with other remains, Mr Williamson states is well worthy of attention. At Burdighouse they occur in the midst of *Unio*, *Cyprides*, and *Microconchus carbonarius*, at Colebrook Dale, with species of *Orbicula*, *Trochus*, *Nautilus*, *Orthoceras*, and *Conularia*, in the lower measures of Lancashire in beds nearly associated with those containing *Goniatites Listeri* and *Pecten papyraceus*, in the higher measures of Lancashire and in Yorkshire, with *Unionidae* and *Entomostraca*, at Middleton, with *Lingulae*, at the top of the series in Lancashire and Derbyshire, with *Mytili*

TWEEDSIDE PHYSICAL AND ANTIQUARIAN SOCIETY

The stated quarterly Meeting of the Society was held on November 18, in the Library room, Kelso. The Duke of Roxburgh presided, and the meeting was very numerous and encouraging, great

accessions being made to the Museum Besides those belonging to the class of Antiquities books and works of art were numerous contributions in the department of Natural History, from Mr Douglas, Mr Dunlop, Astronomer at Paramata (through Sir T M Brisbane, Bart) from Mr J Blacket Sidney, New South Wales

Contributions to the Zoological department, several of them of great interest were received from Dr F Douglas, and from Messrs Wilkie, Beckwith, Yule, Smith Black Lockie, Stevenson, &c , &c As the true value of the Museum must always lie in its collection of objects having a *local* interest, and as all contributions tending to illustrate the Natural History of the district must be deserving of especial attention, such are always received with gratitude

It was announced to the meeting by Sir Thomas Brisbane, that Mr Fergusson of Kelso had volunteered to keep a complete series of Meteorological observations at Kelso for behoof of the Society, provided he were furnished with the necessary instruments, and that he (Sir Thomas Brisbane) had mentioned this to the Duke of Roxburgh who had at once declared his willingness to supply these instruments to the Society at his own expense Sir Thomas also made known his own intention of presenting an Astronomical Clock to be placed in the new building when completed

The Museum, and all that is connected with it is now becoming an affair highly creditable to the district The new building is in an advanced state and its accommodation will be ample and appropriate The friends of the Institution, at home and abroad, are daily becoming more numerous its list of members is at present more full than at any time since its commencement and it is receiving valuable donations from nearly every quarter of the globe

The thanks of the Society were voted to the office bearers for the past year, and particularly to Dr Wilson the secretary and to Mr Heckford the conservator of specimens for the Zoological department of the Museum

ROYAL PHYSICAL SOCIETY OF EDINBURGH

In the notice of Mr E Forbes's communication, p 355 he is represented as maintaining that the cilia of the *Beroë* are not organs of motion We have since learnt that the remarks which he made on this subject had a very different purport namely, that the motions of the cilia were not sufficient of themselves to account for the movements of the animal, seeing that frequently when the *Beroë* or *Cydippe* lay still at the bottom of the vessel in which it was placed the cilia were in active motion

MISCELLANEOUS

MOVEMENT OF THE STYLE OF *GOLDFUSSIA ANISOPHYLLA*

The following note by M. Morgen accompanied the presentation to the Royal Academy of Brussels of a Memoir, entitled "Researches on the Movement and Anatomy of the Style of *Goldfussia anisophylla*" referred to above in p. 396.

"The object of the memoir which I now present to the Academy is to make known the mechanism employed by nature to move the pistil of this interesting plant. In his new Physiology (1838) M. Treviranus regretted that I had not explained my ideas relative to the movement of the column of the Stylidiæ, a movement of which I saw the cause in the excitability of the fecule, considered as an organized part, as a living organ of the plant, and not as a chemical product, as an inert substance. I now fulfill the wish of M. Treviranus by this fresh memoir. The movement of the style of the *Goldfussia* had escaped the investigation of naturalists, it is notwithstanding very remarkable. Most of the flowers in which we see a moveable pistil possess a bilabiate stigma, here the moveable part is awl-shaped and rather spindle-shaped. The true stigma occupies only the dorsal part of the style, and when it bends back it removes as far as possible from the stamina, when it again erects itself, it comes in contact with collecting hairs, which from the position of the flower, or by the help of insects, receive the pollen. The final cause of the phenomenon is very certainly the accomplishment of fecundation, but the mechanical cause is seated in the distension of the cylindrenchyme of the stigma, its tissue is formed by long cylinders dilatable at one or other of the extremities, and each is filled with a liquid containing globules. These globules are excitable. They are naturally carried towards the outer extremities of the cylindrenchyme, and then these extremities dilating, make the stigma bend, but when it is touched the globules and the liquid flow back to the bottom of the cylinders, and in this case, this side becoming the longest, the style erects or bends itself in a direction the reverse of that which it had before. The physiological cause resides therefore in the excitability of a vital fluid. I have made several series of experiments to prove these assertions, and I have given the anatomy of the parts. I am not aware that a similar structure has ever been found in a moveable part of plants.

"The morphology and the metamorphoses of the hairs likewise furnished as to this plant some curious observations. I have taken

in hand to give an account of them "—*Bulletin de l'Acad Royale de Bruxelles*, vol vi No 2

ECHINOSPERMUM LAPPULA

Echinospermum lappula Lehm —My friend, the Rev E A Holmes, F L S , has communicated to me specimens of this most interesting addition to the English Flora, which were gathered by him between Southwold and Walderswick, on the Suffolk coast, in the month of August, 1839 They grew upon the inner slope of a broad gravelly bank which divides some marshes from the sea, at about 150 yards from high water mark and had all the appearance of being aboriginal natives of England —CHARLES C BABINGTON

GUIANA EXPEDITION

The collection of Objects of Natural History made by Mr Schomburgk in the course of his expedition in Guiana from 1835 to 1839, together with numerous specimens of the implements weapons, dresses, and other works of art of the natives, with drawings of various objects and views of the country, the El Dorado of Sir Walter Raleigh, now form a very attractive public Exhibition at No 209, Regent-street

A specimen of the remarkable freshwater fish the Pirarucu (*Sudis Gigas*), a full-sized representation of the *Victoria Regia*, with a geological collection illustrating the formation of the district, are among the many objects of interest The exhibition is attended by three of the Aborigines from the interior of Guiana, the first who ever visited Europe, natives of three Indian tribes, a Macusi, a Warrau, and a Paravilhana

A Prospectus has also been issued for the publication of twelve Views, of the very interesting districts now first explored by Mr Schomburgk , and as their execution must depend upon a number of subscribers sufficient to defray the expense, we trust he will not fail in obtaining adequate support

GREW "ON THE PRINCIPLES OF BODIES"

"The Principles of Bodies, as they must of necessity have their dimensions, and therefore their solid figures, so withal they may be infinitely small, not only beyond all naked or assisted sense, but beyond all arithmetical operation or conception

"To those who are not used to a rigid mathematick proof, this

may be illustrated by the smallness of many organized bodies Ten thousand seeds of the plant called *Harts Tongue* hardly make the bulk of a peppercorn Now the covers and the true body of each seed the *parenchymous* and *lignous* parts of both, the fibres of those parts the principles of those fibres, and the *homogeneous* particles or atoms of each principle, being moderately multiplied one by another, afford a hundred thousand millions of formed atoms in the space of a peppercorn but how many more we cannot define

The same is yet more evident from the stupendious smallness of some animals especially in the sperm of smaller insects Which have been observed by Mr Leuwenhoeck to be a hundred millions of times smaller than a great sand And what then must be the number and smallness of those formed atoms, whereof all the organical parts of these animals are composed?"—*Grew's Cosmologia Sacra*, 1701, p 11, ch vi

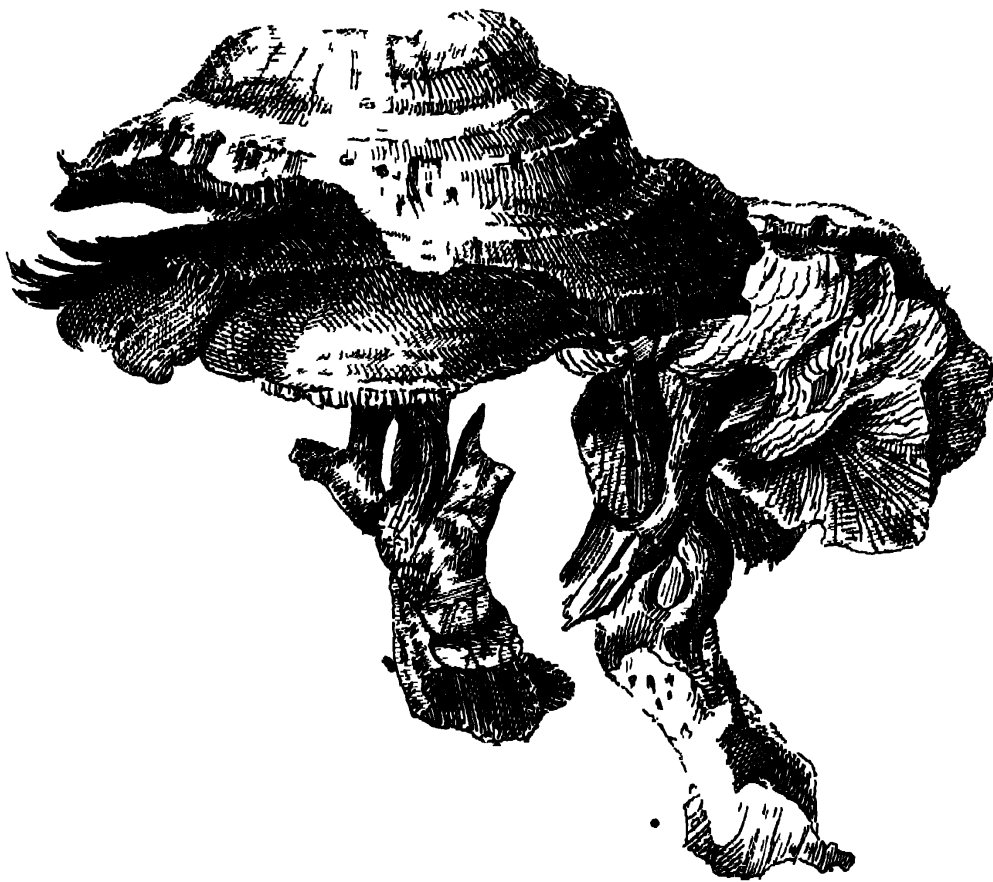
NOTES ON THE BIRTH OF THE GIRAFFE AT THE ZOOLOGICAL SOCIETY &
MLNACFRIE BY PROFESSOR OWEN

Connexion took place between the female Giraffe and the lighter-coloured male on the 18th March 1838, and again on the 1st of April

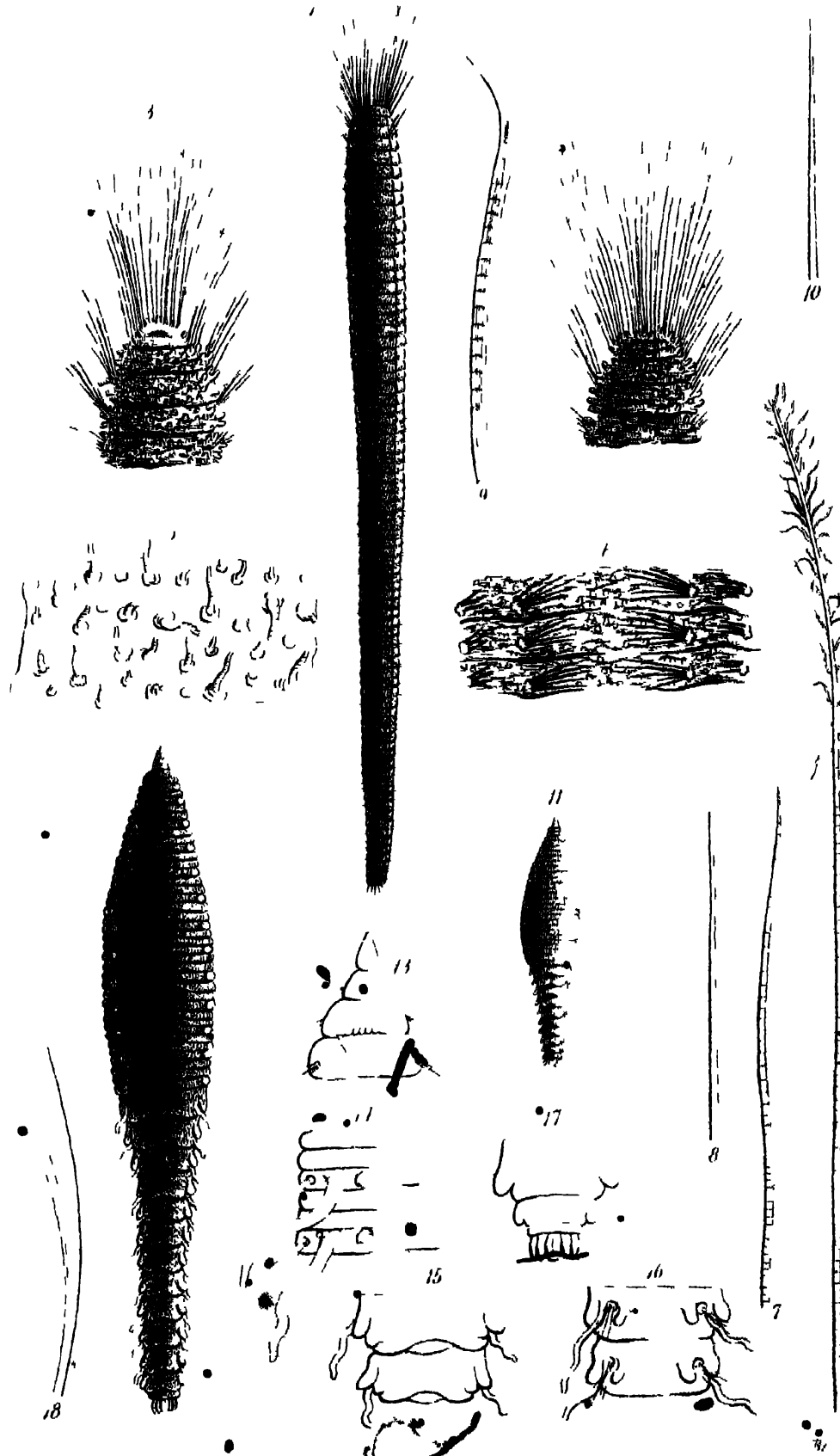
The young animal was a male and was born June 9, 1839, being 444 days, or fifteen lunar months, three weeks, and three days, since the last observed and, in all probability, the last coitus

The new-born animal came into the world like other Ruminants with the eyes open, and the hoofs disproportionately large The skin was marked as distinctly as in the adult, with large angular spots, which were somewhat darker than those of the mother, and the hair of the legs was of a deeper fawn colour It sucked some warm cow's-milk from a bottle with avidity, and once or twice uttered a low, gentle grunt or bleat, something between that of a fawn and a calf The young creature made several efforts to stand, raising itself on the fore knees, and was able to support itself on its vacillating and outstretched legs, about two hours after its birth

"No one could have seen the young Giraffe," says Professor Owen, "without being struck with its large size, compact figure, and strength of limb The condition or purpose of the long gestation is, evidently, to bring into the world the young Giraffe of a stature and strength suitable to the exigencies of a denizen of the desert—the birthplace, likewise, of the Lion and other destructives" The length of the animal, measuring from the muzzle to the root of



• *Dædalea erubescens* Berk



W. H. Lister del. 77

British Annelids

the tail, was six feet ten inches, the girth of the trunk was two feet nine inches, from the tuber ischi to the patella was one foot four inches, from the patella to the apex of the hind hoof three feet, from the olecranon to the carpus was one foot ten inches from the carpus to the end of the fore hoof was one foot eleven inches. These segments of the fore leg were thus nine inches longer than the corresponding ones of the hind leg, and as this disproportion does not exist in the adult, it offers another instance of the precocious development of the anterior extremities in the mammiferous foetus.

She would not yield her milk to, or even suffer her offspring to come near her. The young Giraffe was nourished by warm cow's milk. It gambled actively about when one day old and continued without appearance of illness, till the 28th of June when it was attacked by convulsions, and died — *From the Proceedings of the Zoological Society*

METEOROLOGICAL OBSERVATIONS FOR DEC, 1839

Chiswick — Dec 1—3 Dense fog 4 Frosty fine 5 Slight haze fine 6 Foggy 7 Dense fog fine frosty at night 8—10 Hazy 11 Fine hazy rain 12 Cloudy and windy 13 Overcast heavy rain at night 14 Fine 15 Frosty hazy rain 16 Hazy fine 17 Fine 18 Hazy 19 Cloudy rain 20 Rain 21 Cloudy rain 22 Rain fine 23 Fine very mild for the period of the season rain at night 24 Boisterous with rain 25 Very fine 26 Heavy rain 27 Rain hazy 28 Frosty fine 29 Clear and frosty 30 Frosty and foggy 31 Overcast fine

Boston — Dec 1 Fine 2 Foggy rain p.m. 3 Cloudy rain a.m. 4 Foggy 5 Cloudy rain p.m. 6, 7 Foggy 8, 9, 10 Cloudy 11 Cloudy rain early a.m. rain p.m. 12 Fine rain p.m. 13 Fine 14 Cloudy 15 Fine 16 Foggy 17 Fine 18 Stormy rain p.m. 19, 20 Cloudy rain early a.m. rain p.m. 21 Fine rain p.m. 22 Cloudy rain p.m. 23 Fine rain p.m. 24 Cloudy 25 Fine 26 Fine rain i.m. 27 Foggy 28, 29 Fine 30 Fine hail and rain p.m. 31 Cloudy

Applegarth Manse, Dumfries shire — Dec 1 Clear and sunny 2 Calm and clear hard frost 3 Dull raw day 4 Dull, but dry 5 Frost a.m. thaw p.m. 6 Dull moist day hoar frost early a.m. 7 Dull and cloudy, but dry hoar frost a.m. 8 Fine day slight hoar frost 9 Quiet and cloudy 10 Quiet and cloudy freezing p.m. 11 Fine day wind rose p.m. 12 Heavy rain in the afternoon 13 Fine morning rain afternoon 14 Moderate day slight frost preceding night 15 Foggy slight frost preceding night 16 Fine slight frost early a.m. 17 Raw and cold 25 Stormy day of wind and rain 26 Clear day frosty morning 27 Snow in the evening, and frost all day 28 A little more snow hard frost p.m. 29 Clear and calm and frosty 30 Looking dull a.m. sleet and rain p.m. 31 Heavy rain all morning cleared up p.m.

Sun 20 days. Rain 9 days Snow 3 days Frost and hoar frost 13 days
Wind easterly 13 days North-east 4 days Southerly 4 days, Westerly 2 days

Calm 13 days Moderate 5 days Strong breeze 4 days Brisk 2 days

Metenrological Observations made at the Apartments of the Royal Society by the Assistant Secretary, Mr ROBERTSON, by Mr THOMPSON at the Garde of the Horticultural Society at Chiswick, near London, by Mr VEALL at Boston, and by Mr DUNBAR at Applegarth Manse, Dumfriesshire

Days of Month		Barometer				Thermometer				Wind				Rain		Dew point.
		Chauvick		Boston 8 1/2 a.m.	Dumfries-shire		London Roy Soc		Chauvick		Dumfries-shire	London Roy Soc 9 a.m.	Chauvick	Dumfries-shire		
		Max	Min		9 a.m.	8 1/2 p.m.	Fahr 9 a.m.	Self register	Max	Min					London Roy Soc 9 a.m.	
1899	Dec	29 708	29 810	29 724	29 63	37 7	38 4	37 6	41	29	34	40	34 1/2	E	E	38
1	1	29 882	29 992	29 890	29 78	38 8	39 4	37 2	42	33	37	36 1/2	28 1/2	E	E	36
2	2	29 960	29 985	29 962	29 61	38 8	39 4	35 8	42	27	37	44	31	S	S	34
3	3	29 830	29 963	29 835	29 48	34 3	34 6	32 0	38	30	35	36 1/2	34 1/2	NW	NW	34
4	4	30 096	30 48 1/2	30 124	29 67	36 7	37 2	33 3	37	28	34	36	27 1/2	SW	SW	33
5	5	30 364	30 50 1/2	30 397	29 54	36 7	37 3	36 0	37	32	38	38 1/2	32	W	W	35
6	6	30 332	30 366	30 239	29 95	34 9	35 3	34 2	42	28	35	35 1/2	30 1/2	E	E	33
7	7	30 096	30 124	30 014	29 83	34 9	35 3	33 4	35	31	36 5	36 1/2	31 1/2	E	E	35
8	8	29 830	29 860	29 712	29 60	34 9	35 3	34 7	37	32	35	36	32	NE	NE	33
9	9	29 664	29 651	29 637	29 35	34 2	36 7	34 2	42	34	34	37	34	E	E	31
10	10	29 606	29 598	29 326	29 24	42 4	43 0	34 3	46	39	41	42	32	E	E	31
11	11	29 248	29 286	29 190	29 18	41 8	45 3	41 9	48	35	42	45	39	S	S	37
12	12	29 294	29 311	29 277	29 10	43 5	46 4	41 3	48	42	38	46	38 1/2	S	S	39
13	13	29 230	29 400	29 247	29 07	44 2	44 4	42 3	49	30	43	40 1/2	40	SW	SW	40
14	14	29 590	29 596	29 427	29 15	39 3	40 0	38 8	43	41	36	40	32	SE	SE	36
15	15	29 696	30 083	29 713	29 20	40 3	40 5	38 8	44	30	36	40	32	SE	SE	38
16	16	30 074	30 094	29 868	29 64	38 3	38 8	37 4	44	31	34	38	32 1/2	NE	NE	37
17	17	29 516	29 539	29 376	29 17	35 2	35 5	34 7	42	41	38	5	—	E	E	32
18	18	29 418	29 426	29 356	29 08	47 7	48 4	34 7	55	50	46	—	—	S	S	40
19	19	29 282	29 480	29 262	28 82	51 3	51 7	47 3	55	46	46	51 5	—	S	S	46
20	20	29 552	29 566	29 561	28 96	47 3	47 7	46 6	55	46	46	—	—	SW	SW	46
21	21	29 550	29 547	29 376	28 95	49 9	50 6	46 8	55	47	47	—	—	SW	SW	45
22	22	29 586	29 586	29 333	28 95	48 6	49 3	48 4	57	48	47	—	—	S	S	49
23	23	29 244	29 416	29 302	28 64	53 4	54 6	48 5	54	44	50	—	—	SW	SW	48
24	24	29 528	29 568	29 530	28 39	47 2	49 4	45 9	48	28	42	—	—	SW	SW	52
25	25	29 732	29 728	29 322	29 28	40 7	41 2	38 3	54	38	34	37	30	E	E	48
26	26	29 342	29 577	29 386	28 90	47 2	47 8	39 4	46	29	42	34	29 1/2	NW	NW	42
27	27	29 752	30 062	29 759	29 30	35 7	36 0	35 8	39	24	33	34 1/2	21 1/2	W	W	45
28	28	30 280	30 440	30 320	29 81	33 3	33 5	32 2	40	21	32	35	26	W	W	40
29	29	30 398	30 436	30 163	30 08	32 3	32 5	32 0	44	34	29	35	21 1/2	SE	SE	33
30	30	29 924	29 975	29 727	29 45	44 8	45 3	32 0	52	45	42	44 1/2	34	S	S	33
31	31															38
Mean		29 729	29 821	29 656	29 65	41 0	41 8	38 4	45 35	31 96	38 9	38 7	31 4	Sum 2 326	2 32	3 67
																Mean 38 6

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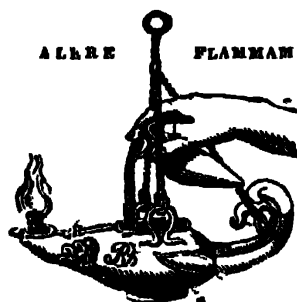
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